

Computerworld Extra!

EXTRA! EXTRA! EXTRA!

'Computerworld's 109,000 subscribers will find something *Extra!* in their mailboxes next week: A bonus issue that will focus its entire editorial contents on a single subject, 'Software in the '80s.'

A highlight of the first *Computerworld Extra!* issue, scheduled for publication Sept. 7, is a wide-ranging interview with James Martin, considered one of the foremost authorities on the social and commercial impacts of computers. Martin discusses the chief technological forces at work in society and what they may mean for DP in the '80s.

The bonus issue represents the first time in its 13-year history that CW has added to its weekly publication schedule.

"With this special issue, *Computerworld* will keep its readers abreast of the fast-paced trends and developments shaping the vibrant new decade in software," according to E. Drake Lundell Jr., vice-president-editorial of CW Communications, Inc.

Extra! will also include specially prepared feature length articles by 10 experts in the software field. Among them:

• Daniel D. McCracken, consultant and former Association for Computing Machinery president. McCracken believes soft-

ware development will remain the albatross around the neck of DP executives but that new tools may transform DP from the whipping boy to the hero of the organization.

• Stephen L. Robinson, data base consultant. There will be more effective use of data base systems, Robinson predicts, but for most organizations it will be the late '80s before data base truly realizes its potential.

• Dixon R. Doll, president of the DMW Group, Inc. Structured programming techniques will become obsolete, Doll says, as alert corporations try to link users and data directly. Still missing, though, are the effects

(Continued on Page 6)

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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More Than a Decade Ago

IBM Brass Knew TNF 'Possible' Carcinogen

By E. Drake Lundell Jr.

CW Staff

ARMONK, N.Y. — Top IBM executives knew that chemicals in its copiers — and later its 3800 printers — were possibly carcinogenic more than a decade ago, although the firm did not report that fact to the Environmental Protection Agency (EPA) until this spring.

In fact, the possible carcinogenic effects of the chemicals were discussed by the firm's top management officials during the spring of 1970, when IBM was planning its first copier product.

These discussions, however, were dwarfed by management's concerns over the profitability of that product.

Both the Management Committee (MC) and the Management Review Committee (MRC) of IBM were informed of the possible carcinogenic effects of chemicals during these discussions and almost all of the present top IBM executives — including Chairman Frank T. Cary, President John R. Opel and General Counsel Nicholas deB. Katzenbach — were present for the discussions.

An IBM spokeswoman last week ad-

mitted that the firm knew that TNF was a "suspected carcinogen" in 1970, but added that "although TNF was a suspected carcinogen in animal cells, on the basis of our testing, we concluded that under the conditions in which we were using it, in the photocopying process, it did not pose a health hazard."

"Nothing in our continuing test results has altered that position," she said.

Under the Toxic Substance Control Act — passed in 1976 — companies are required to notify the EPA 90 days be-

fore they market certain chemicals.

While the original IBM copier and the 3800 printer — which uses the same drum with the suspected carcinogen — were already on the market at the time the act was passed, IBM notified the agency just this past spring that laboratory testing had revealed a possibly hazardous chemical in the 3800.

That chemical, however, was in use with IBM's first copier product and was known to its management to be a possible carcinogen when that product was introduced in 1970, according to minutes of the meetings of the two top IBM executive groups.

For example, in an MC meeting held April 1, 1970 and attended by John Opel, then a senior vice-president, among others, "the MC was informed that the photoconductor is carcinogenic," according to IBM documents introduced in the *Texex vs. IBM* case in (Continued on Page 8)

Carter Tax Credit Predicted Boon to Users

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — For computer users, the biggest single benefit of President Carter's new economic incentives program is his proposal to broaden the investment tax credit, according to Vico E. Henriques, president of the Computer and Business Equipment Manufacturers Association.

Under the present rules, Henriques explained in an interview last week, capital equipment must remain in use for seven years before the owner can deduct 10% of its cost from his tax bill. If the equipment's useful life is less, the credit declines.

The Administration now proposes to grant a 10% credit for purchase of any capital equipment used for more than one year. As a result, Henriques said, computer users will be encouraged to upgrade or replace more of their existing systems.

The investment tax credit, along with the President's other proposals, is aimed at encouraging businesses to

increase investments in new plant and equipment, create additional jobs, improve productivity and promote exports.

Other major parts of the program include an accelerated depreciation period for capital investments which will

"increase the rate of return and cash flow for firms investing in new plant and equipment"; increased income tax exemptions for Americans working in the Middle East; and a tax deduction to new businesses for startup expenses (Continued on Page 5)

FBA Option Announced for Intel Fast 3805

By Rita Shoer

CW Staff

PHOENIX — Fixed-block architecture (FBA) is available on the IBM plug-compatible Fast 3805 semiconductor disk from Intel Corp. through a microcode option introduced here.

Designed for installations which utilize IBM's VM operating system, the VM modifications required to facilitate the use of the Fast 3805 with what has been dubbed native mode (NM) software were developed by technicians at the University of Waterloo, Ont., Canada, the vendor said. These changes to VM also mean that IBM will no longer support the operating system, accord-

ing to Intel.

Future releases for the modified system would be supplied by the University of Waterloo, Intel added.

The NM option is said to significantly improve mainframe performance by reducing the host processor's channel-driver overhead an average of 70%. This performance improvement would apply when a Fast 3805 running with NM is compared with any device that runs with the IBM 2305 channel program, according to Herb Oberman, product manager.

These would include IBM's 2305 fixed-head storage unit and the 4305 semiconductor disk from Storage

Technology Corp. (STC) as well as Intel's Fast 3805 minus the NM microcode, he said.

The reported performance improvement figures would seem to bear out industry speculations that FBA devices can run faster and cheaper [CW, July 14]. An FBA option has not yet been announced for either the 2305 or STC's 4305.

Utilizing FBA, the NM option partitions Fast 3805 storage into uniform blocks based on the block length specified during system initialization, a vendor spokesman explained. The blocks are addressed by a number as (Continued on Page 7)



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Better Price/Performance AS/9000 Seen Besting IBM 3033

By Jeffry Beeler

CW West Coast Bureau

PALO ALTO, Calif. — A high-end mainframe that reportedly offers anywhere from 30% to 80% better price/performance than the IBM 3033 was added last week to National Advanced Systems Corp.'s (Nasc) IBM-compatible processor line.

Billed as Nasc's largest and most powerful general-purpose CPU to date, a fully configured AS/9000 provides approximately twice the performance of the 3033 uniprocessor for only about a 20% higher price, a spokesman said.

The AS/9000 reportedly also offers roughly 33% and 50% better price/performance than the 3033/AP-1 and 3033/AP-2, respectively, while consuming about a third less electrical power and occupying half the floor space.

As part of its main processing unit, the AS/9000 incorporates 16K words of reloadable control storage that allows the mainframe to be restructured as needed to accommodate additional hardware and software functions.

Support for 3375, 3380

One of the first performance features scheduled to be added to the product during the next year to 18 months is support for IBM's recently announced models 3375 and 3380 disk systems. The 3375 will reportedly be supported in data-streaming mode, while the 3380 will transfer data to the Nasc processor at 3M byte/sec.

Another performance feature targeted soon for addition to the AS/9000 is support for both Release 1 and 2 of IBM's MVS Systems Products

(MVS/SP). Operating systems already supported by the IBM-compatible processor include MVS, VM/370 and VS/1, a Nasc spokesman explained.

Among its other main features, the AS/9000 sports emitter-coupled logic circuitry that holds 550 gate/chip and boasts 700-psec switching. The density of the machine's large-scale integrated circuitry reportedly allows the product to be cooled entirely by air and thus to dispense with complex water-chilling apparatus.

The AS/9000's introduction marks the debut of Nasc's third Advanced Systems mainframe family, which bears the same designation as the 3033-compatible processor itself. For the time being at least, the AS/9000 is the infant family's only member.

Processor Complex

The AS/9000, though often referred to simply as a "processor," in fact consists of, not just one, but several computers that together form a "processor complex." Each of the complex's constituent parts is said to be individually microprogrammed.

In addition to the CPU itself, the complex incorporates:

- A 20-nsec arithmetic function that speeds fixed- and floating-point operations by three to fivefold.
- Two independent service processors, one for each of the AS/9000's two 20-in., four-color CRT displays.
- Up to three input/output processors.

Supplied to Nasc by the Japanese mainframe manufacturer Hitachi Ltd., the AS/9000 reportedly boasts about 67% better price/performance than the 3033 uniprocessor and provides

roughly 10% more raw computing power than a similarly configured 3033/AP-1, AP-2 or MP. In price/performance, the latest Nasc processor beats the 3033MP by approximately 80%.

One reason for the AS/9000's purported performance edge over its IBM counterparts lies in the Nasc processor's reduced machine cycle time, which has been rated at 40 nsec, compared to 57 nsec for the 3033 models.

Two other hardware features that contribute heavily to the AS/9000's reported competitive advantage include the 20-nsec arithmetic function and a 64K-byte cache buffer that uses two-way interleaving and 40-nsec bipolar random-access memory chips, the spokesman said.

In addition to 12 data channels and two I/O processors, a minimum AS/9000 configuration incorporates an 8M-byte main memory, expandable in 2M-byte increments to a maximum of 16M bytes. The processor's main storage, which offers a 320-nsec read/write cycle, uses eight-way interleaving with 16K-bit NMOS memory chips.

A maximum AS/9000 configuration with a 16M-byte main memory and 16 channels costs \$4.52 million, with optional leasing arrangements available.

First customer shipments of the AS/9000 will begin this November and coincide with the start of support for MVS/SP Release 1. The beginning of support for MVS/SP Release 2 will come next June.

More information about the AS/9000 and its accompanying support features can be obtained from Nasc at 3145 Porter Drive, Palo Alto, Calif. 94304.

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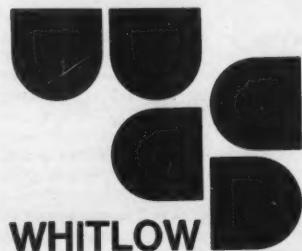
Hood

High Sheriff of Armonk accuses SyncSort OS of "taking from rich, giving to poor!"

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WHITLOW
COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

NEWS REPORT

In a crowded press conference, the High Sheriff of Armonk today charged that a sort program is "taking resources from rich computer systems and giving them to poor OS/VS users throughout the Realm."

Speaking to reporters at his heavily fortified castle, the Sheriff, Sir Basil Bathrobe, said: "Frankly we think it's time somebody blew the whistle on this Robin SyncSort fellow and his so-called Merry Band.

"These varlets cause trouble every time we send an expensive system through Whitlow Forest. First they capture it, then they use software black magic to extract more sorting work for fewer resources.

"And the worst part is that they pass these savings along freely to thousands of SyncSort users. As a result 62% of the nation's OS/VS users are saving anywhere from 15% to 50% on the amount of CPU Time, Elapsed and SIOs they use. They're simply evading their sorting taxes," the Sheriff said.

"King John has authorized me to say that he views this situation with great alarm. He hasn't been so upset by anything since Magna Carta!"

Gee, we'd like to thank Sir Basil for his kind words about SyncSort's performance. But we wish he'd mentioned that we have a couple of other strings in our long bow:

LIBERATING PROGRAMMERS. To make life a little easier for stout-hearted applications programmers, SyncSort OS includes a whole quiver full of sharp labor-saving features:

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- INREC/OUTREC — reformats records on input and output;
- MAXSORT — greatly reduces disk-space requirements on large sorts, and improves BREAKPOINT/RESTART capability.
- BETTERGENER — provides outstanding resource savings on most straight-copy tasks when compared to IBM's IEBGENER.

RESCUING MAIDENS: We're particularly proud that the SyncSort band includes some of the best customer-service types in the business. If you encounter any sorting question, send up a signal. We'll notch up an arrow and shoot you back an answer fast. About 80% of all service requests are resolved within 24 hours.

SO JOIN OUR MERRY BAND. Put on our distinctive money-green suit and come out into Whitlow Forest. Find out that sorting can be fun. Give us a call. Ask for Maid Marian, Friar Tuck or Little John.

Data Entry Found Averaging 9.2% Pay Boosts

By Rita Shoer

CW Staff

WILLOW GROVE, Pa. — Data entry operators averaged pay boosts between 8.2% and 9.2% compared to an overall average of 7% for DP personnel in general, according to a survey by the Administrative Management Society (AMS) here.

As of Feb. 1, the weekly salary for lower level ("B" classification) key-

punch operators was \$184 in the U.S., and operators classified as "A" (higher level) received \$205 per week, the survey found. These figures represented respective increases of 8.2% and 8.5% over 1979 salaries for the same jobs, AMS said.

While CRT terminal operators received a lower weekly salary (\$189) than the A-level keypunch operators, the annual increase of 9.2% was

greater, according to the report.

The U.S. weekly salary for the eight DP positions included in the survey was \$260, AMS said. This reflected an overall average increase of 7% over the \$243 weekly salary for the same group one year earlier, the firm pointed out.

Among the employment classifications included in the DP portion of AMS' report were computer operators, programmers, programmer/analysts and systems analysts. The 34th annual survey, published in 1980-81 *AMS Office Salaries Directory*, also covered 12 clerical positions and included some 543,446 employees in 6,613 companies from 134 U.S. and Canadian cities.

Keypunch operators in Canada also realized wage increases higher than the average 10.3% increase for 1980, according to the survey. Based on the AMS figures, A and B-level operators increased their weekly salaries by 12% and 14.4%, respectively. However, Canadian CRT terminal operators' weekly increases kept pace with the average DP increase of 10.3%.

central, southern and western regions. Both classifications of keypunch operator received the highest weekly salary in the east central region, based on the report. However, CRT terminal operators in the western region took home the highest paychecks in their job classification, AMS said.

Manufacturing Pays Most

Based upon breakdowns for U.S. keypunch and CRT terminal operators according to type of business, the manufacturing/processing area pays the highest average salary, the professional management association noted. The average weekly salary for A-level keypunch operators was \$224 with CRT terminal operators and lower level keypunch operators receiving \$210 and \$201 per week, according to the respondents.

The four additional categories included in this portion of the AMS survey were banking/insurance/financial, retail/wholesale sales and distribution, government agencies and an "all other" category including utilities, educational and medical institutions and employment firms.

Regional and business breakdowns are not available for Canada, AMS explained, because of a smaller sample size and the fact that only 12 of the 134 participating cities are in Canada.

In addition to salary figures, the survey includes such fringe benefit data as length of work week, paid holidays, overtime, unionization and vacations for respondents from U.S. and Canadian firms, AMS said.

Copies of the report may be obtained for \$75 by writing to the Administrative Management Society, Maryland Road, Willow Grove, Pa. 19090.

Average Weekly Salaries for Keypunch and CRT Operators						
Position	U.S.		Canada			Percent Increase
	1979	1980	Percent Increase	1979	1980	
Keypunch Operator A	\$189	\$205	8.5%	CS216	CS242	12.0%
Keypunch Operator B	\$170	\$184	8.2%	CS194	CS222	14.4%
CRT Operator	\$173	\$189	9.2%	CS193	CS213	10.3%

U.S. Weekly Averages — 1980 by Region			
Region	Keypunch Operator A	Keypunch Operator B	CRT Operator
Eastern	\$208	\$185	\$186
East Central	\$213	\$193	\$187
West Central	\$204	\$180	\$181
Southern	\$190	\$175	\$186
Western	\$210	\$185	\$208

U.S. Weekly Averages — 1980 by Type of Business*			
Type of Business	Keypunch Operator A	Keypunch Operator B	CRT Operator
Manufacturing/-Processing	\$224	\$201	\$210
Banking/Insurance/-Financial	\$187	\$165	\$172
Retail/Wholesale Sales & Distribution	\$203	\$180	\$178
Government Agencies	\$194	\$180	\$197
All Others*	\$211	\$194	\$197

*This category includes utilities, educational, medical and employment.

Charts Courtesy of AMS

Low End

Despite the percentage figures, data entry operators are still on the low end when compared to the salaries received in other DP-related positions, AMS said.

In the U.S., salaries for the eight DP positions range from \$184 per week for lower level keypunch operators to \$417 per week for systems analysts. Canadian systems analysts top the surveyed group with weekly salaries of \$440 in Canadian dollars compared with \$213 received by CRT terminal operators, AMS noted.

The survey also identified salary averages on a regional basis by dividing the U.S. into eastern, east central, west

MAYNARD, Mass. — Digital Equipment Corp. last week announced a dual-module disk storage unit for its Decsystem-10 and Decsystem-20 mainframe computer systems, offering 1.2G bytes of unformatted storage space.

At the same time, the company announced reduced memory prices for the Decsystem-20 and its Decsystem-1091, and enhancements to the firm's Tops-10 and Tops-20 operating systems to accommodate the new disk drive.

The RP20 disk drive is currently the highest capacity disk offered by DEC. Each unit consists of two data modules, each providing more than 469M bytes of formatted disk storage. In addition, each module has 15 recording surfaces with two read/write heads per surface and a transfer rate of 1.2M byte/sec, a spokesman claimed. The dual port option is said to allow each data module to transfer data independently.

DEC is also incorporating the RP20 disk drive into a disk subsystem called the RTP20. Up to four RP20 disk drives can be included on the RTP20's controller. A total of six RTP20 subsystems can be attached to Decsystem-10 and Decsystem-20 mainframes, for a total of more than

22G bytes of formatted storage, the spokesman said.

Software enhancements in the Tops-10 and Tops-20 operating systems fully support the RTP20 disk storage subsystem, DEC said. Through the operating system enhancements, the RP20 disk can also be used with the Decsystem-1090, dual-1090 and -1091 computers and Decsystem-2040, -2050 and -2060 configurations.

Finally, DEC has reduced memory prices for the Decsystem-20 and Decsystem-1091 mainframes. The MF20 memory, which was previously priced at more than \$56,000 per 256K-byte expansion unit, now costs \$42,000.

The high-capacity disk introduction and lower memory cost are both aimed at improving the whole system cost of the Decsystem mainframe, according to Joseph Biula, DEC's Large Systems Product Manager.

The RTP20 subsystem with one RP20 disk unit costs \$140,000. Additional RP20 disk units are priced at \$49,000.

There is no charge for enhancements to already installed Tops-10 and Tops-20 operating systems, the spokesman noted from 146 Main St., Maynard, Mass. 01754.

CICS/VS

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Within Hours of Firing

Suit Filed Against Worker for Erasing Programs

By Tim Scannell

CW Staff

NORRISTOWN, Pa. — An electrical instrument manufacturer here has filed suit against a former employee who allegedly destroyed a number of critical computer programs within hours after being fired.

Joseph Hershman, a project manager and programmer while at the company, allegedly used a remote terminal to tap into the firm's IBM 370/158 Model 3 computer system and erased programming related to one of the company's latest products — a microprocessor-based control system.

Using a password assigned to him by Leeds & Northrup, the former employee allegedly gained entry into the computer shortly after midnight on June 5. He then allegedly spent nearly 12 minutes on the system, wiping out programs needed by the firm for its Max-1 control system product, the suit claimed.

In the suit, filed in Montgomery County Court, Leeds & Northrup originally sought "not more than \$10,000" in damages, plus a court order restraining Hershman from tampering with the computer in the future, Theodore J. Swift, a spokesman for the firm, said. However, last week, Hershman's lawyer, responding to the suit, reportedly met with the company's lawyers and reached an agreement "which did not involve dollars." Terms of that agreement and a possible out-of-court settlement could not be released at this time, Swift maintained.

Leeds & Northrup personnel discovered Hershman's alleged unauthorized entry into the computer when later

that same day they tried to erase the ex-employee's password key and found that data was missing. Any information pertaining to Hershman and the work that he did on the Max-1 microprocessor control system while at the company had been wiped out, Swift explained.

Leeds & Northrup routinely changes passwords every four to six weeks and blocks out a password when an employee leaves or is let go, he added.

Checking the computer's log, which keeps an ongoing record of the hour, minute and second of anyone who accesses the system's files, Leeds & Northrup people learned that Hershman had entered the system at

about 12:48 a.m. on June 5 and used the computer for 11 minutes and 39 seconds, presumably the time it took to erase the needed computer programs.

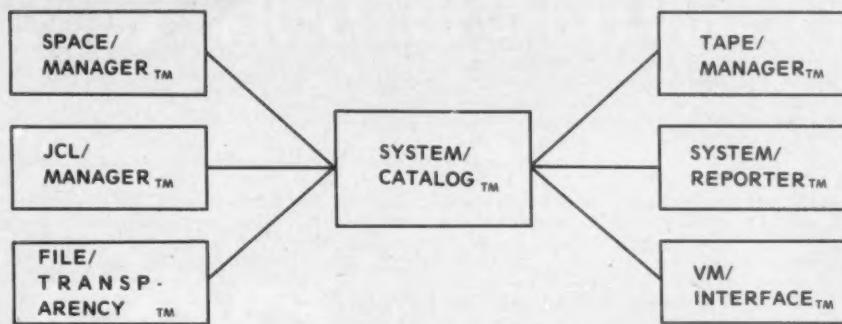
Fortunately, the instrumentation manufacturer was able to immediately restore the obliterated programs from a set of backup magnetic tapes. The tapes are periodically created from information on the system's disk files and serve as a hedge against natural disaster or incidents of deliberate computer sabotage. It is not known whether Hershman was aware of the existence of the backup tapes, Swift said. However, the Max-1 project would have been seriously jeopardized

if the erased programs were not able to be restored.

Basically, Leeds & Northrup filed suit to find out exactly how much damage Hershman did to the computer's files and whether that destruction ranged beyond the project he was working on at the time of his employment, Swift noted. The "not more than \$10,000" in damages asked for in the suit is roughly what it would cost in man-hours to search through all of the computer's disk files for additional sabotage.

The company also filed suit to make the issue public and possibly deter any future deliberate acts of sabotage by disgruntled present or past employees.

FRUSTRATED WITH DOS/VS(E)?



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Gets 300 Responses

Firm Advertises for Other Unhappy B800 Users

By Tim Scannell

CW Staff

NORTHBROOK, Ill. — "Attention: Unhappy users of Burroughs B800 and similar Burroughs computer hardware and software..."

That is how an ad placed recently in *The Wall Street Journal* began. The ad was authored by a dissatisfied Burroughs Corp. customer — Quality Books, Inc., a publisher and book wholesaler here. The firm was preparing to sue Burroughs for faulty computer equipment and wanted to hear from other firms that may have been the victim of "overly zealous computer salespeople [that] may have misrepresented the Burroughs B800."

To date, the unconventional ad has drawn more than 300 replies from B800 or B800 users across the country, according to Tony Leisner, general manager at Quality Books. "It became pretty obvious that we were not the only ones whose system didn't work," he said, noting that there were already a number of active lawsuits concerning the B800 minicomputer.

A Burroughs spokesman at the company's corporate headquarters said he was not aware of the problem or the ad.

Unused System

About two years ago, Quality Books, which sells material to schools and libraries, purchased a Burroughs B800 computer system to help with its order entry and accounts receivable. The system has 128K bytes of memory, two terminals and a printer. However, since its installation the computer has reportedly never worked.

In fact, for the past six to eight months, the machine has been unplugged and wrapped and sits in a corner of the Quality Books building, Leisner explained. The company's business chores are presently conducted through a service bureau.

When the Northbrook company first

had difficulties with the newly delivered B800, officials there complained to Burroughs service personnel who promptly told them that they "were the only ones having problems, everybody else's B800s were working fine," Leisner related. But, after running the ad in the midwestern edition of *The Wall Street Journal*, which drew 50 to

60 responses, and later in the national issue, the company knew that its problems were not particular to its system.

During the past few weeks, Burroughs representatives and the firm's attorneys have had at least one "sit-down session" to discuss Quality Books' problems with its B800. Leisner declined to discuss just what problems

are involved with the system because of the "sensitive position" of present negotiations. However, thus far "nothing definite has been set one way or another," he pointed out.

"We have a suit prepared but have not filed it... pending the opportunity to sit down and talk turkey with Burroughs," Leisner commented.

Analysis Predicted Win for Miss Kansas

DE KALB, Ill. — If Professor George L. Miller's method of statistical analysis is as accurate this year as it was last year in predicting who would win the Miss America contest, Leann Folsom of Kansas now wears the crown.

Miller, a Northern Illinois University professor of business systems and analysis, accurately predicted in 1979 that Miss Mississippi, Cheryl Prewitt, would win the title, with odds of 9 to 2 [CW, Oct. 1, 1979].

The predictions — which last year caused quite a flap among fellow statisticians and pageant officials — are based on computer analyses of 13 variables that contribute to each candidate's composite statistical profile, according to Miller.

Folsom's profile indicated highly probable success based on choices made by past pageant judges. In fact, Miller listed odds of 2 to 1 that Miss Kansas would be the next Miss America, far better than the odds he gave to last year's winner.

Miller pointed out that his predictive model, which he has refined over the past year, "is set to be right about one out of four times on the basis of information available on the day of the finals."

Applying his model to past pageants, Miller said that if he used just pageant data as in the case of Miss Kansas, the model would have been on target for four of the last 17 years. Using information available on the days of



Miss America?

the finals, the model would have accurately predicted a winner eight of 17 times.

Miller also pointed out that Miss

America contestants can walk into the competition with a number of strikes against them, according to his analysis of past contestants and winners.

For example, a winner's ancestry usually does not go back to southern or southeastern Europe; judges seem to prefer western or northern European backgrounds. Furthermore, a contestant who twirls a baton, tells jokes, dances or comes from a large city probably will not win either, according to Miller's analyses.

Asked if judges might be influenced to vote for or against Folsom because of Miller's prediction, Miller pointed out that the effect could be positive or negative depending on the individual judge.

The data was processed — last year on IBM 360/67 and 370/148 mainframes and this year on an Amdahl Corp. 470V/7A computer — using the Statistical Analysis System (SAS) software from SAS Institute, Inc. of Raleigh, N.C.

Former Exxon Manager Arrested for Alleged Deal

By Marguerite Zientara

CW Staff

PHILADELPHIA — A former Exxon Corp. employee who allegedly tried to sell to IBM detailed plans for Exxon's as yet unreleased Hornet line of information processing products was arrested recently by a Federal Bureau of Investigation agent posing as a representative of IBM.

Orion N. Briel, until recently a manager of marketing publications for QYX, the Exxon division developing the Hornet system, has been charged with mail fraud in offering the plans to IBM by mail, according to U.S. Attorney Peter Vaira.

Briel resigned from QYX on Aug. 13. The next day, he allegedly mailed a certified letter to Dan McGlaughlin, vice-president of marketing for IBM's Franklin Lakes, N.J., office, offering the plans, according to Vaira and U.S. District Court documents.

McGlaughlin immediately contacted Exxon and Exxon then contacted the FBI, Vaira said. On Aug. 22, according to the documents, McGlaughlin telephoned Briel, who allegedly repeated his offer to negotiate the transaction.

Five days later, on Aug. 27, the FBI agent and Exxon engineer Jack Atkin, both posing as IBM representatives, met Briel at the Holiday Inn in King of Prussia, Pa., near the Pennsylvania Turnpike.

Briel allegedly presented the two men with detailed plans and specifications for the Hornet product line, as well as

for other products, and offered to sell the information for \$100,000.

Atkin told federal agents the plans "were very detailed" and had the "potential to badly hurt" Exxon, according to Vaira. The plans, which Atkin called bona fide information, had been previously reported missing from a desk and cabinet at QYX headquarters in Lionville, Pa., by an Exxon security official.

Briel was arraigned in U.S. District Court here and released on \$3,000 bail. He "most likely will be indicted" within two weeks, Vaira said. By law, a trial date must be set within 60 days of an indictment, he added.

Neither QYX's spokesman on the matter nor Briel was available for comment.

'Extra' to Focus On Software

(Continued from Page 1)

ive pathways between the two.

• Ronald G. Ross, editor of "Data Base Newsletter." Data management will rise to the fore in the '80s, according to Ross. In an excerpt from his forthcoming book, Ross tracks the expanding role of data dictionaries.

• Herbert L. Gepner, group managing editor/software at Datapro Research Corp. Gepner describes the exploding demand for off-the-shelf application packages.

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Fastest Boat, Simplest Micro Win Cup Trials

By Tim Scannell

CW Staff

NEWPORT, R.I. — After battling for nearly two weeks in the sometimes

IBM Price Cuts May Mean More

WHITE PLAINS, N.Y. — The IBM Data Processing Division has cut purchase prices for its 3211 printer and 3811 controller. The 3211 Model 1 dropped from \$53,440 to \$40,080 and the 3811 Model 1 was reduced from \$23,580 to \$17,685, effective Aug. 22.

However, maintenance charges for the 3211 were increased by 10% to \$740 a month. Balancing that was a 20% maintenance decrease for the 3811, to \$158 a month.

Industry experts feel the purchase price decreases are a precursor to the introduction of a new printer model and speculated IBM may be coming out with a faster — up to 3,000 line/min. — model to replace the 2,000 line/min. 3211. The 3211 is currently the firm's fastest impact line printer. In some configurations, it can operate at up to 2,500 line/min.

Introduced along with the 370 mainframe in June 1970, the original price tag on the 3211 was \$129,150. Prior to these cost reductions, the most recent price alteration was a blanket 5% increase for purchase, rental and lease prices last Dec. 28.

Intel Debuts FBA Option

(Continued from Page 1) signed to a given range of blocks. Then, data transfer into the storage blocks is started with two channel commands.

When operating in native mode, the Fast 3805 also utilizes all of the storage capacity available with no loss from the inter-record gaps found on rotating disks, Intel said. This capability is said to increase usable disk storage in some installations by 30% or more.

The Fast 3805 semiconductor disk runs in emulation of an IBM 2305 disk with IBM's 2835 controller, Oberman said. Since two Fast 3805 controllers can be contained in a single box, it will be possible for the single unit to have one Fast 3805 emulating the 2305 and the second controller operating under native mode.

The Fast 3805 for which the NM option was designed utilizes random-access memory to provide a storage capacity from 12M- to 72M bytes, Intel said. The standard data transfer rate is 1.5M- to 2M byte/sec depending upon CPU channel characteristics.

Available in late 1980 both as an upgrade for current Fast 3805 users and as an option to be considered by potential Fast 3805 customers, the NM software including the VM modifications leases for \$350/mo, Intel said.

A typical Fast 3805 configuration of one controller with 12M bytes of storage is priced at \$4,870/mo on a 36-month lease and can be purchased for \$158,000. Intel's Commercial Systems Division is at 12675 Research Blvd., P.O. Box 9968, Austin, Texas 78766.

stormy waters of Rhode Island Sound, victory in the recent America's Cup trials went to the fastest boat — not to the one with the more sophisticated computer system.

The 12-meter yacht Freedom and its onboard Hewlett-Packard Co. 9825 microcomputer beat the two other American contenders, Clipper and Courageous, following a series of elimination races. Freedom will defend the U.S. against the Australia, winner of the challenger's spot, when the America's Cup races begin Sept. 16.

During the American elimination trials, Clipper's navigation system relied on a Data General Corp. MP/100 microprocessor aboard the 12-meter yacht and a DG 4/X minicomputer located on shore [CW, Aug. 18]. The

seagoing micro was linked to nearly every marine instrument on the yacht and recorded such factors as apparent wind speed, boat speed and the direction the yacht was sailing.

Clipper's microcomputer continually transmitted data back to the 4/X via a specially modified Avanti Communications Corp. modem.

Courageous' Micro

Contrary to previous reports, the crew of the Courageous also used an onboard computer to monitor the effects of wind and wave on the sleek yacht. A Digital Equipment Corp. LSI-11 microprocessor was used throughout the rigorous trials and incorporated a number of recently developed programs that reportedly aided

skipper Ted Turner in the competition. Data monitored by the shipboard micro could also be selectively recorded by Courageous' navigator, Bill Jorch, who, when he is not sailing, is a computer programmer and engineer at Grumman Aerospace Corp. Unlike the massive amounts of data continuously recorded by Clipper's MP/100 computer and 4/X minicomputer, Courageous' micro recorded nautical information at the push of a button.

Once ashore, Jorch or Turner could review the data on a DEC VT-103 terminal, transfer it to disk or produce hard copy for later analysis.

It is not known if the Australian crew will be using a computer to navigate during the week's races.

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SDI Drops Rental, Requires Two-Year Lease

By Marcy Rosenberg

CW Staff

SAN MATEO, Calif. — Users of SDI, Inc.'s system software will no longer have the option of renting these products on a month-by-month basis. Instead, they will be required to commit to two-year leases by Sept. 21 or the products will expire.

Previously, users had the choice of either renting month by month or leasing at the same monthly rate for a two-year term.

An SDI spokesman said its new policy applies to all products: Grasp, Grasp/VS, Dox, Epat, Fleet and Fleet Online, Reach and Fasttp. Monthly charges under two-year lease contracts signed by Sept. 21 will remain the same as current per-month fees.

Citing a general rise in the cost of doing business, the spokesman called SDI's two-year lease requirement "a decision made in lieu of having to raise prices. We're seeking longer term commitments rather than raising prices."

SDI notified customers of its policy change by registered letters mailed Aug. 15, giving them about 30 days to decide whether to go with the two-year lease plan.

Users Object

Although given the 30 days' notice required under contract, a number of SDI users voiced objections to the new policy. "A \$50,000 commitment over two years is not something we want to do," stated the director of computer operations at a New York City publishing firm that has rented Grasp/VS on a month-by-month basis since 1973.

As a result, this user is weighing whether to convert to Power/VS from IBM, an effort it estimated would normally take three months to complete. "Unless we can get a stay of SDI's decision, we'll have no choice but to put in more than 100 hours of in-house staff overtime plus at least 60 to 80 hours of consultant time" to convert by Sept. 21, the computer operations

director said. The cost to his firm: "Approximately \$5,000 to \$6,000."

Nevertheless, he feels the conversion effort is worth it for his department — a DOS/VS shop running one 768K-byte and one 384K-byte IBM 370/145 — because Power/VS provides certain features for on-line systems and programming development that Grasp/VS doesn't offer. For example, his shop uses IBM's Entry Time Sharing System/II (ETTS/II) and "ETTS

printed output cannot be retrieved at a terminal using Grasp/VS."

Cost savings was also one of the reasons another Grasp/VS user, St. Luke's Hospital, New York, decided to switch to Power. Admitting that the department was planning not to renew with SDI anyway, systems and programming manager Carol Pulaski noted that Grasp/VS — which her installation has been renting for the past seven years — "was costing us \$1,300

to \$1,400 per month."

She was quick to add, however, that her department has received "excellent" service from SDI and that an advantage of Grasp/VS is that it will start printing output before a job is finished, "saving some time" over Power, which will wait until a job is completed before printing unless the job is segmented. Pulaski's shop runs one 512K-byte 370/148 under DOS/VS.

IBM Knew TNF 'Possible' Carcinogen

(Continued from Page 1)

1972.

At the time, the MC was discussing possible problems with launching the firm's planned copier product. The firm had planned to inform production line workers that the product contained dangerous chemicals, but "the MC was dissatisfied with the manner in which we planned to notify employees of this fact," according to the minutes.

The MC was not worried about users, however, since it felt that they would have no contact with the carcinogenic substances even though it now says that trace amounts might be transmitted to people operating the 3800 printer, which uses the same chemical.

In a meeting just the next day of the MRC — the highest management group in IBM at the time — that body received a report listing four drawbacks of the system including "potential medical exposures to chemicals on the drums."

That meeting was attended by T.J. Watson Jr., the chairman of the board, T.V. Learson, presently a board member and then president, and F.T. Cary, then one of five senior vice-presidents. While the possible medical problems for employees was one of the issues, a higher priority problem was the "financial outlook" for the project, the minutes indicated.

The Management Committee met again the next day to discuss "the proposed methods of handling the health and safety problems associated with the copier." The MC agreed with an unidentified proposal for handling informing the employees, although it apparently did not mention the possible carcinogenic effects of the chemicals used.

According to the minutes, "The MC agreed [with the methods to handle the problems] although Marshall indicated that he would be inclined to use the word cancer if appropriate."

Burke Marshall, a former U.S. Attorney General, was at that time a senior vice-president at IBM, and resigned just 10 days after the incident, although there is nothing in the minutes to indicate why he resigned.

Tests Reviewed

Another mention of the chemicals comes in a presentation before the Management Review Committee on April 7, 1970, where it is noted that an IBMer "reviewed the history of the medical tests made on the drum material which had the potential for carcinogenic reaction. It was agreed that the exposures here were minimal."

The rest of the meeting — attended by Opel, then a senior vice-president, Cary, Watson, Learson and Katzenbach, among others — was spent reviewing the "market potential" for the

copier program. Almost 10 times as much space in the minutes is devoted to profits and marketing as is to the health problems.

Confirmed Carcinogen

The chemical in question is Trinitrofuran (TNF) which was confirmed to be a carcinogen by the EPA in mid-August.

The chemical was used in the first IBM copiers, the Model 6800, introduced in 1970. Later IBM incorporated the same drum into its 3800 laser printing system, which was introduced in 1975.

In May of this year, IBM reported to the EPA that it had discovered that TNF might be a carcinogen and reported that fact to the EPA [CW, June 9]. The EPA confirmed that fact in August [CW, Aug. 25].

TNF is known to induce gene mutations in bacterial and animal cells in laboratory experiments, based on IBM data, EPA said, but whether it is harmful to humans is still unknown, according to the EPA's preliminary evaluation.

IBM has claimed all along that there is no danger from the chemical to users of the 3800. IBM notified users about the existence of the chemical in the printer's photoconductor process, but assured users that there is no health hazard involved.

TNF, according to IBM, may come into contact with the printer's toner, which is subsequently deposited on the printed page. Trace amounts of the chemical may remain on the output copy and might from there be transmitted to persons operating or servicing the machines.

Additional Data

IBM maintains that the amount — estimated at a maximum of three micrograms per page — would be too small to pose any health risk to humans. Presently the EPA is waiting for additional data from IBM before making recommendations on the chemical's continued use.

The data requested includes how much TNF is found in the air around the operating printer, how much of the chemical remains on the paper with the toner, whether TNF reacts with other chemicals and what happens to the spent toner after it is removed from the photoconductor.

This information will help to "better determine the nature and the extent of any possible risks of injury to human health due to exposure to TNF," the EPA stated.

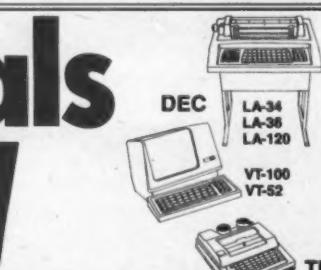
For now, however, the EPA has not suggested that people refrain from using the equipment. IBM has said it will cooperate fully with the EPA.

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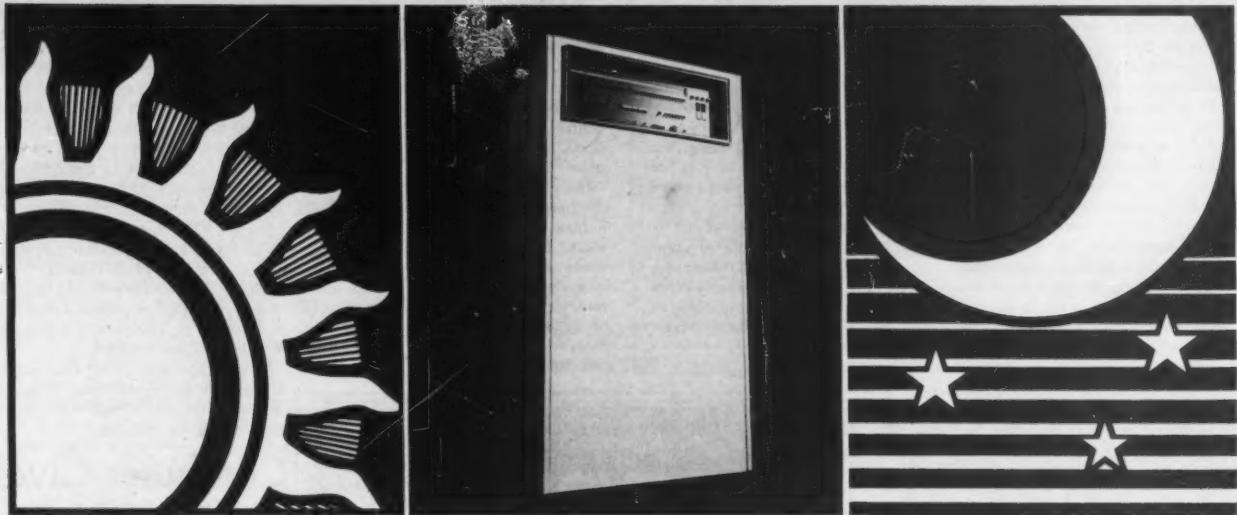
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IDC October Conference To Focus on Productivity

SAN DIEGO — "Information Processing Profitability and Productivity in the 1980s" will be the subject of International Data Corp.'s (IDC) Fall Executive Conference here Oct. 19-22. The issue of falling productivity in both factories and offices will be addressed.

The conference will examine the nature and dimension of the productivity dilemma in relation to what today's information processing executive can do to improve productivity within his own organization. The agenda includes a program in personal productivity improvement through physical fitness and improved life-style management.

ment, led by former NASA astronaut trainer Rob Rideout.

Immediately following the IDC conference is "The New Electronic Media" conference, sponsored by the Link Resource Group, a subsidiary of IDC. It will take place Oct. 22-24, and anyone attending the IDC program is invited to stay for all or part of the Link event at no extra charge.

Conference registration (IDC) is \$750; the fee for additional company members is \$495. More detailed information is available from the IDC Conference Coordinator at 214 Third Ave., Waltham, Mass. 02154.

Climate Control Malfunction Annihilates Laboratory Mice

LOS ANGELES — Murder by computer is apparently a reality at the University of Southern California's Andrus Gerontology Center, where a malfunction in a computerized climate control system was blamed for the death of more than 1,500 laboratory mice.

The mice died when temperatures in the basement storage area rose to 106° F from the preset temperature of 72° to 78° F. Scientists, who described the scene as reminiscent of the Guyana massacre, said 1,500 of the 2,000 laboratory mice were found dead, and most of the 500 survivors have either died from shock or have been rendered useless for further experiments.

The mice were part of an estimated \$1 million worth of federally financed biological research projects being conducted at the center. Dr. Harold Slavkin, a scientist at the center, estimated it would cost the university about \$75,000 to replace the mice.

He also said much of the research in which the mice had been used might have to be repeated.

Some of the mice had been specially bred for specific research. Others, at the crucial age of 30 months — the equivalent of an 80-year-old human — were being used as part of a study into the effects of aging on the brain and the body, Slavkin noted.

Slavkin did not know what kind of climate control system was being used at the center, and school officials were unavailable for comment.

Computer Gives Bay State Unions Political Clout

BOSTON — Massachusetts is one state in which organized labor will have more power to inform and persuade its members in time for Sept. 16 congressional primaries, thanks to computer power.

Although Massachusetts' AFL-CIO previously used a "long and cumbersome" manual system to prepare address labels for bulletin mailings to its 500,000 members, that task can now be accomplished in one day, according to John A. Callahan, director of the state's Committee on Political Education (COPE) — the political arm of the AFL-CIO State Labor Council.

Formerly taking about a week for a mailing to go out to members, the method now involves a single phone call to national AFL-CIO headquarters in Washington, D.C., where data on the group's 13 million national members is stored in a Univac 9030 computer with 512K bytes of memory.

Any mailing labels the state unit requests are generated in Washington and sent directly to the state for its mailing purposes. Such mailings, which contain information on the voting records of congressmen, the status of legislation on issues like job safety, collective bargaining rights and disabled workers' benefits, may go out two or three more times before the upcoming primary, according to Callahan. "It's a tremendous improvement," he concluded.

While the state theoretically could have tapped into the national system before now, "we didn't have the money," Callahan explained. Funding for the operation was approved at the AFL-CIO's state convention two years ago.

"The system is very standard in a sense, but yet it's not, since each state can do what it wants [with the system]," according to AFL-CIO Computer Department Director Richard Drennan.

"The extent to which a state is successful with it, or uses it, depends upon the state. You can have a file and use it, or you can have a file and not use it" — exactly what Massachusetts has done until now.

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Pioneer 4331 Installation Braves Software Snags

By Rita Shoor

CW Staff

LOMBARD, Ill. — "The hardware went in smoothly ... [but] the software was a little different."

That's how Andrew Filipowski, president of DBMS, Inc. here, summed up what is said to be the first installation of a configuration including IBM's 4331 with two 3370 fixed-block architecture (FBA) disks and the vendor's 600 line/min Model 3262 printer.

While he lauded the efforts of IBM's support staff to help with the DBMS installation, everything about the software was a surprise, according to Filipowski.

The peripherals required Release 2 of the DOS/VSE operating system and there was no System Installation Product Option (Sipo) available for this particular configuration, he explained. "Every component in the system had to be generated separately."

Another problem encountered by the system technicians employed by the software products and services firm was the inability of OS/VSE to support the 3262.

Eventually, this problem was solved by getting OS/VSE to run under VM with Release 2 of IBM's Basic System Extensions, he said.

Around the Clock

"If it weren't for the exceptional skill of our [in-house] personnel, it could have been a disaster. But by working around the clock, we were able to bring up and tune all the software within 10 days," he said.

This success came about "in spite of the fact that we were clearly pioneering with almost every software item," the firm's representative remarked.

In contrast, "the hardware went in smoothly," according to a company spokesman. "The only exception was that we received blue panels on our printer instead of brown."

Delivered to DBMS on June 22 and

Asimov to Open Strategy Seminar

WHITE PLAINS, N.Y. — Dr. Isaac Asimov, noted science fiction author and lecturer, will keynote a seminar on "Information Strategies for the Eighties" (IS-80) here on Sept. 30-Oct. 2. Sponsored by Turnkey Systems, Inc., the conference will emphasize new and emerging computer-based productivity methods.

"Yesterday's Science Fiction Is Today's Reality" is the title of Asimov's presentation.

Other keynoters will include Charles P. Lecht, president of Advanced Computer Techniques, who will speak on "The '80s: Harnessing the Power We Built in the '70s," and Gideon Gartner, president of the Gartner Group.

Attendance at IS-80, which will be held at Stouffer's Inn of Westchester, is limited to 200 enrollees. The fee for the seminar is \$965.

More information and registration forms are available from Turnkey Systems, Inc.'s Education Division, 50 Washington St., Norwalk, Conn. 06854.

installed by July 10, the configuration includes the 3262 printer which Filipowski described as a "very low-cost device that could make the whole package very attractive" from a cost/benefit standpoint.

The firm had opted to purchase the system, consisting of the 1M-byte 4331, two 3370s with a total of 1.2G bytes of peripheral storage and one 3262 printer, for approximately \$210,000, he said. The two-year lease price for the printer alone had been quoted as \$373/mo, he said.

That price range was acceptable to DBMS, which did approximately \$3 million worth of business in fiscal 1980.

While some firms have had delivery problems with 4331-based systems

[CW, May 12], DBMS was very fortunate in IBM's 4300 series lottery, Filipowski recalled. "We were lucky to get an early ship date in the lottery," he said.

"However, we should have requested more 3370 disk units with that original order," he said. "We ordered two more 3370s the day our system was delivered and IBM gave us a shipment date of Jan. 7, 1983."

He felt that the vendor might have underestimated the user demand for the 3370 and is now "trying to discourage orders" for that device.

The alternative for DBMS is the 3340 disk subsystem which Filipowski said had a much higher cost per byte than that offered by the 3370. Although the 3344s, which can be tied to the 3340,

are more price-competitive with the 3370, at least one 3340 is required, he said. However, "in order to protect ourselves, DBMS has ordered a 3340 subsystem as well as the 3370s."

"We may not be as cost-sensitive as other installations," he said. "If we need the disk space, we'll get it." Therefore, the 3344s are considered to be an interim solution to future storage problems, he noted.

After reviewing the cost differential between IBM's 4331 Model 2 and its 4341, DBMS has also opted to place a 4341 on order for November 1981. The larger machine was ordered because the cost savings for the Model 2 did not make up for the increase in processing power offered by the 4341, he said.

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Group Meets to Strengthen Role of Minorities

By Bruce Hoard

CW Staff

WASHINGTON, D.C. — Black Data Processing Associates (BDPA) will elect national officers, formally accept its charter and generally try to consolidate and solidify its national identity at the group's second annual meeting here the 21st and 22nd of this month.

The approximately 750 members will also take in technical and vendor displays and attend a workshop in business opportunities, according to Earl

Pace, BDPA national coordinator and one of the organization's cofounders.

Organized in 1976, BDPA is devoted to "strengthening the expertise of the minority members of the DP community," Pace said, adding the organization is working to "offer this expertise to those minorities who are evaluating DP for its career/business potential.

"Here's an opportunity for someone to throw off the discriminatory labels we have lived with and do something good," the national coordinator said.

The minority group is hoping to attract more members by participating in such high-profile activities as outreach programs for high school and college students, Pace said. To date, an arm of the organization has worked with handicapped students at the University of Pennsylvania and several public schools in Philadelphia.

Although predominantly black, BDPA membership also includes some Hispanic DPs, Pace said. "Although the objectives of our association are directed toward the minority members of the DP profession, our membership

Progress is coming in the form of more and more minority-owned DP organizations, he claimed, saying he knows a dozen minority members with DP businesses of their own.

Tracing the history of minorities in DP, Pace discussed his own beginnings in the field and said other minorities traveled similar paths.

When he graduated from college in 1965, there was a great national furor over the Civil Rights Act and the age of tokenism was dawning, he said. Pace sought work in labor relations with the Pennsylvania Railroad.

The young graduate was stumped because one black was already employed in that department and "they quote, end quote, did not have any openings," he claimed. However, there was an opening in the DP department and no other minority had applied yet. So Pace filled the slot after taking a test he still has doubts about passing 15 years later.

Eventually, the industry grew so fast, labor demand outstripped available supply and blacks found themselves able to find jobs where before they couldn't, he said.

Best and Worst

He labeled the Northeast Corridor between Washington, D.C., and Boston as the best area for black DPs to seek jobs because of the many computer companies and manufacturers there. But, somewhat paradoxically, he claimed the New England area is the most likely place for blacks and other minorities to encounter discrimination. "I place the New England area as a place of subtle discrimination," Pace said.

Ironically, the Sunbelt states of the southern and southeastern U.S., traditionally bastions of racism, are now the up and coming places for minorities to find DP employment.

Racism in Industry

"Very subtle," was his reply when asked about the state of racism in today's U.S. DP industry. Only the rapid growth of the industry has made it possible for blacks and other minorities to gain a foothold on jobs, and most of those jobs have been lower level, data entry type of positions, he said.

Pace is anxious to see minorities leave "the computer room and coding pad behind" and move up the managerial ladder. "I think DP organizations owe minority employees some preparation so they can move to those higher positions," he commented.

"As a whole, the southern states are desegregating faster than the northern states and New England," he declared.

Call for Papers

SECOND ANNUAL DP PERFORMANCE MANAGEMENT CONFERENCE, Phoenix, Feb. 22-26, 1981.

The second annual conference is being arranged by Applied Computer Research of Phoenix and Performance Management Associates of Scottsdale, Ariz. The focus of the four-day program will be on "Using Performance Management to Improve DP Productivity."

Presentations will be management-oriented, interactive and do not require formal papers, although A/V reproductions are requested for the audience.

Areas to be addressed at the conference include DP productivity measurement, productivity in development, management of change, pricing DP services, fulfilling user service objectives, the role of planning in PM, problem resolution and using PM to improve DP productivity.

More information is available from Jim Christensen, Conference Coordinator, Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

COMPUTER LAW JOURNAL, SPECIAL ISSUE.

The Computer/Law Journal has issued a call for papers for a special two-issue set entitled "Law and Information Policy" to be published in early 1981.

Papers are being sought in all areas of the information process, from the legal aspects of fact-gathering, to information storage, retrieval and transmission.

Topics of interest include privacy, protection of data bases, viewdata and similar systems, transborder data flow, access to government data bases and cryptography.

Guest editors for these special issues are Dr. Jon Bing and Prof. Selmer of the Norwegian Research Center for Computer and Law.

Authors interested in submitting papers for these issues should write Bing at the Norwegian Research Center for Computers and Law, Oslo University, Karl Johans Gl. 37, Oslo 1, Norway, or to Michael Scott, Editor in Chief, Computer/Law Journal, 530 W. Sixth St., 10th floor, Los Angeles, Calif. 90014.

ELEVENTH CONFERENCE ON COMPUTER AUDIT, CONTROL AND SECURITY, New York, May 4-8, 1981.

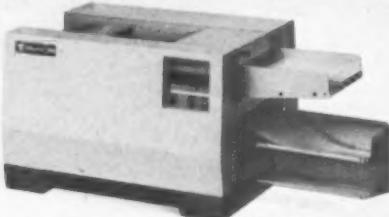
The conference is jointly sponsored by the EDP Auditors Foundation, Inc. and Automation Training Center, Inc.

"How to" papers are wanted on new approaches to problems, pioneering efforts in advanced systems, case histories and new audit, control or security techniques.

Authors wishing to submit a paper should send a brief abstract which includes the key ideas and approach to the topic of the paper. A brief personal resume and business telephone number are also requested. Abstracts submitted from outside North America should explain the proposed talk in great detail.

Abstracts must be received no later than Oct. 1 by Harold Weiss, program chairman, Automation Training Center, Inc., Suite 17, 11250 Roger Bacon Drive, Reston, Va. 22090.

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Boston Edison Computer Tracks Power Thieves

By Bruce Hoard

CW Staff

BOSTON — Computers played a key role in the arrests of nine people charged with stealing between \$15,000 and \$20,000 worth of electricity from Boston Edison Co. here last week.

Boston Edison's IBM 370/158 has also led company officials on a path that may culminate in the arrests of 100 additional energy thieves, who have collectively stolen some \$50,000 worth of power from the utility, according to a spokesman.

The customers arrested last week, from nearby Stoneham, were accused

of altering their meter readings for periods ranging between two months and a year. If convicted, they could be penalized by up to a year in jail and a \$1,000 fine. They would also be required to make reparations for the stolen electricity.

Millions Recovered

The utility has unearthed an average of 1,200 cases of theft yearly since it implemented its computer detection strategy in 1975. About \$4,000,000 has been recovered over that four-year period.

Boston Edison is confident it can do even better, saying once all the bugs are worked out of its system it will be

able to spot suspicious accounts more easily and with more regularity.

The basic detection strategy is a simple one. The utility, which serves 550,000 customers in 40 Greater Boston cities and towns, uses the computers to seek out accounts with large disparities in the amount of electricity used from one month to the next. The spokesman refused to divulge anything beyond that, citing security reasons.

Currently, about 100 suspicious cases weekly are being called to the attention of field surveillance and meter reading personnel assigned to track offenders, the spokesman claimed.

Not far away in Westboro, Massa-

chusetts Electric Co., an even larger utility, serving 750,000 customers throughout western and central Massachusetts and the Merrimack Valley, is using similar tactics to trap thieves.

That utility uses its IBM 370/168 and 370/158-based computer system and a corp of approximately 10 full-time field investigators to study historical billing periods and match records, according to Dick Nadeau, Mass Electric System Diversion Manager.

"Right now, the computers are not effective as the field investigators, but we feel they are pointing us in the right direction," he said. That direction led to 745 arrests and the return of \$556,000 in 1979, he reported.

Sotheby's to Hear Computer Bids

By Bruce Hoard

CW Staff

NEW YORK — "What am I bid for this beautiful IBM 370/168 computer system used only on Mondays by an office of elderly accountants in Fort Lauderdale?"

Such a seemingly outrageous line may actually be heard at the Sotheby Parke-Bernet, Inc. Business Systems Department's inaugural computer hardware auction here this fall.

Sotheby's, a firm that has auctioned off books, fine arts and "just about everything under the sun for 250 years," is now expanding to include computers, according to John Carr, director of the Business Systems Department.

From a mailing list of 20,000, 1,200 companies requested auction catalogs and probably a third of them are willing to sell their equipment at Sotheby's auction, Carr claimed.

He is hoping to highlight the auction with several large IBM mainframes, but also plans to include plug-compatible mainframes and "an array of peripherals, minis and non-IBM hardware. We're going to sell what the market demands."

If the first auction is successful, the firm will continue running them on a quarterly basis at Sotheby's new gallery at the corner of 72nd St. and York Ave. in Manhattan and at other sites around the country.

"We may have peripheral auctions even more frequently than that," he declared.

Sealed, open-floor and telephone bids will be accepted at the auction, which Carr said was made possible by the rapid growth of the used computer market.

Eastern Airlines Sets Univac 1100 Courses

MIAMI — Eastern Airlines' Computer Education Department will offer 30 courses, ranging from one day to two weeks, oriented toward Univac 1100 software systems.

The courses, slated to begin Nov. 3, will feature specialized but practical technical education in the areas of demand and real-time communications, the department said.

Details and enrollment information are available from Gail Fraser, Eastern Education, Eastern Airlines, Miami International Airport, Miami, Fla. 33148.

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CW 98

Concepts Do Not Transcend Tools

Computer-Generated Art Still Has a Way to Go

By Marguerite Zentara
CW Staff

SYRACUSE, N.Y. — Great artists have always dealt with concepts that were way beyond the tools they used, according to artist Joseph Scala, and therein lies the problem in computer art today. "At the moment, people using computers are dealing with the tool and not dealing with concepts that transcend the tool."

Currently in his third year as Director of Galleries for Syracuse University, Scala has virtually stopped "making art," as he calls it, and instead concentrates on displaying other people's masterpieces.

Although he still likes, sells and exhibits his past works, Scala is in a "dry period" as far as his own creativity goes, and one reason for it is the dissatisfaction he felt with his so-called "computer art."

"I ended up spending more time on the technology than on the art," he recalled. "The tool became more important and time-consuming as I progressed and I also became very discouraged with the output."

"The final printed output either looked too mechanical — it looked like it was made by a machine — or it lacked the human touch, an element that I felt was necessary in art," Scala said.

Scala quit computer art two years ago. Although from 1970-1978 he believed in the natural partnership of art and technology — as witnessed by the designs on these pages, made during that period — he has since undergone a complete change in viewpoint.

Emphasizing that his views are "strictly personal and related to myself" as well as subject to change, Scala maintained that computer technology has not evolved to the point where an individual can truly express himself in an original way using it.

"I'm not putting down computer art, but it has a long way to go before any significant art will come out of it," he contended. "Most so-called computer art, with very few exceptions, has been produced by scientists and engineers who have no sense of art."

"These pseudo-artists — unless they happened to have a machine that makes designs — would otherwise never attempt to make any art."

Classical Training

Scala, on the other hand, has wanted to be an artist "as early in my life as I can remember" and early on received a "very classical training in the arts." Nevertheless, he eventually studied for and received a B.S. degree in math because it was more practical than art.

After nine months in his first job as an engineering aide in a defense plant, Scala "couldn't stand it" and resigned. Scala then taught math in a secondary school and eventually, in 1969, enrolled in Cornell University's graduate program in fine arts — where he first encountered the computer.

After graduating from Cornell, Scala took a teaching position at Syracuse University's Department of Experimental Studios. Searching for contemporary technology to apply to art took Scala to a computer graphics workshop conducted by computer artist Dr. Ken Knowlton from Bell Telephone



Figure 1

Joseph Scala, shown in Figure 1, has used computer programs to design the commercially applicable work shown in Figure 2 and Figure 3 as well as the artistically 'purer' applications on the next page.



Figure 2

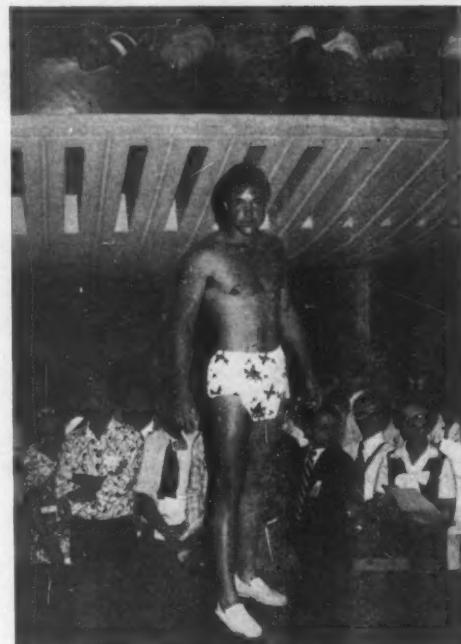


Figure 3

Laboratories, Inc.

It was Knowlton's software package for artists, Explor, that "opened up a new world" to Scala and his students and launched his eight-year period of computer-aided artistry.

Less Than Ideal

While Scala maintained his enthusiasm for the medium for almost a decade, he now looks back on the period as something less than ideal. "Even then, I often found myself changing the work — putting my hands in and making the computer output different," Scala recalled. "I'd add either paint or color or something, because I didn't like the mechanical end result."

"Either it looked too much like everybody else's computer artwork or it had some personality on it other than my own," Scala said, attributing that to the fact that he generally used programs written by other people.

"[Knowlton's] package generated a certain look which bothered me because it was more Knowlton than it was me," he said. "You got to the point where you had to invent your own software and even then you had to face the problem of the output with that machine-look."

And Scala "wasn't that interested in writing original software programs from scratch. First of all, I found it was fruitless because [the artwork] all came out looking alike anyway," he said. "So I never bothered to do that and just manipulated the packages I had."

Computer-aided video output, on the other hand, does not display the artificial look of hard copy output and allows the artist necessary self-expression, Scala maintained.

However, "in going to paper in any way, you have the whole history of art that that piece of paper has to go up against, and computer technology hasn't reached the point of sophistication to compete with art drawn by human hands," Scala said.

In such cases, "the hardware and the

software get in the way of the art," Scala said. "The technology hasn't reached the point where an artist can really use it to say anything that's aesthetically new — the technology's new, but the art isn't."

"Even though there are some things that can be done much more quickly with the computer, very complex patterns done at great speeds, no one has yet been able to make any artistic statement of any significance that couldn't have been done just as well some other way," he added.

Emphasizing that the situation could change with increased sophistication

of the technology, Scala noted, "I don't want people to think this is my proclamation forever."

"Some Leonardo DaVinci-like genius could come along and do marvelous things with the computer, but we haven't yet reached that point," he added.

On the other side of the coin, Scala suggested, "the computer could actually change the aesthetic tastes of a whole generation, so that what people look at now as being uninteresting, in 25 years may be extremely important and may even be the only art that's significant."

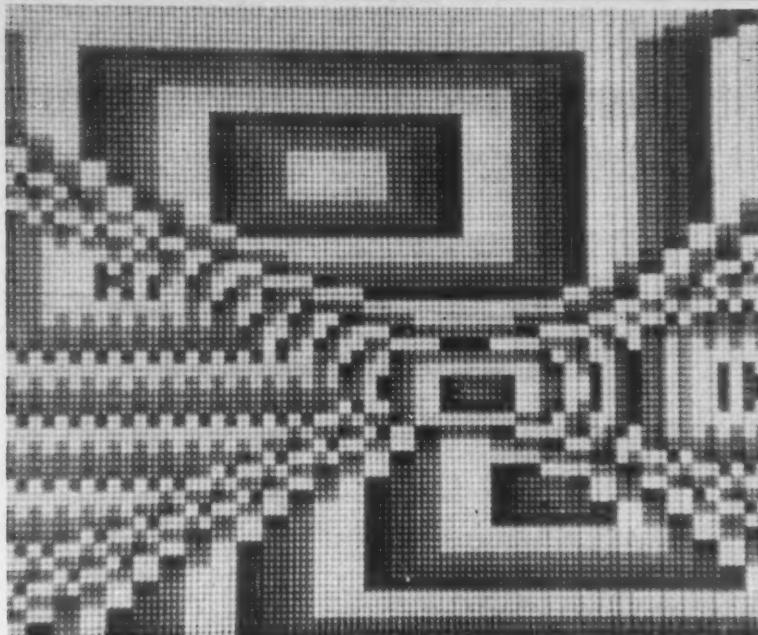


Figure 4

'Art, But Not Great Art': Computer Prints Images Suitable for Framing

SYRACUSE, N.Y. — Calling his computer-generated designs "art, but not great art," Joseph Scala offered some insights into exactly how they were produced.

The graphic design "Exploring" (see Figure 4) originates from a program called Explor, designed especially for artists by Dr. Ken Knowlton, another well-known computer artist.

Explor, which stands for the production of images from Explicit Patterns, Local Operations and Randomness, allows images to be printed on a high-speed line printer, making the time between execution and finished print extremely fast, Scala explained.

"In fact, with our [Digital Equipment Corp.] Decwriter terminals, the image is typed back almost immediately," Scala said. Each individual image can be produced as many times as the artist wants and each individual point or area of points can be changed explicitly or randomly by the artist's program.

Image Manipulation

While the graphic output in such a process is "immediately suitable for framing," Scala said, further work on an image can produce quite a different result.

Figure 2 illustrates what such additional manipulation can produce.

Using several software packages, including Explor and Splat (Simplified Programming Language for Artists), Scala used Syracuse University's IBM 370/155 mainframe and DEC VB-10C display to produce the desired design for printing on the caftan's material.

Splat involves working with a predefined symbol, such as a circle, square, polygon or line, and drawing and manipulating these symbols by writing

a program, "which is closer in concept to the way a traditional drawing is made," according to Scala.

The image produced was then photographed from the CRT screen and its negative was made into a high-contrast, nonhalftone print called a Kodalith. The Kodalith, in turn, was transferred to a silk screen and printed on cotton cloth, which was then made into the caftan.

In Figure 3, the same basic process produced the design for the bathing suit's material, with the exception that the output to be photographed was from either a California Computer Products, Inc. plotter or high-speed line printer, instead of a CRT terminal, Scala said. Several such suits, designed and made by Scala's students, were last displayed at the 1978 Siggraph conference in Atlanta.

If you are wondering whether anyone would actually wear such a garment, rest assured that "I even got orders for the stuff; they wanted to buy it, but the students didn't want to sell it," Scala recalled. "I think it's something that is going to come into the mainstream of the textile and fashion design business very shortly."

Figures 5 and 6 are examples of Splat's video output, shown here as photographs of the CRT screen. They were taken from a video entitled "Our Father," which arose from "an idea of putting together things in myself that make me up, and that affected my childhood and so forth," Scala explained. "It just sort of all came together."

The wiggly line traversing the pictures is an oscilloscope voice pattern of a person reciting the Lord's Prayer. The work was produced using the VB-10C and an oscilloscope.

'I even got orders for the stuff; they wanted to buy it, but the students didn't want to sell it,' Scala recalled. 'I think it's something that is going to come into the mainstream of the textile and fashion design business very shortly.'

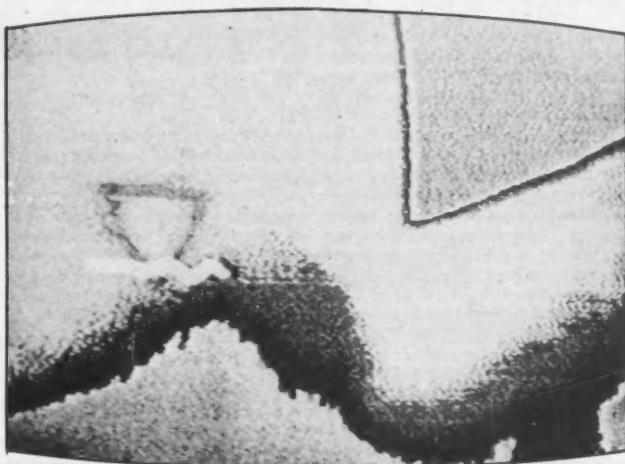


Figure 5

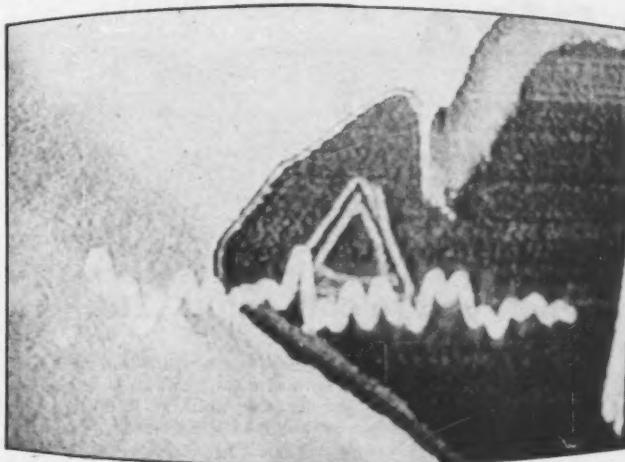


Figure 6

Joseph Scala's more artistic efforts are illustrated here by Figure 4, entitled 'Exploring,' which used Ken Knowlton's Explor program. Figures 5 and 6 are images from a color video display, 'Our Father.'

While Conservatives Cheer Proposals Australian Unions Condemn Technology Report

The long-awaited report by the Committee of Inquiry into Technological Change has finally been released to resounding boos from the socialists but cheers from the conservatives and most of the computer industry.

The report was commissioned by the federal government "to examine, report and make recommendations on the process of technological change in Australian industry in order to maximize economic, social and other benefits and minimize any possible adverse consequences" (CW, Aug. 4). It was prepared by a committee of three men: Prof. Rupert Myers, an academic who, as chairman, gave his name to the so-called "Myers Report"; Allan Coogan, chairman of Nabalco Pty. Ltd.; and Bill Mansfield, federal secretary of one of our most powerful unions, the Australian Telecommunication Employees Association.

Its brief was to identify technological change and its impact, to examine overseas experience and to review the effectiveness of government policies and programs in facilitating the introduction of new technology.

In the U.S., where technological change does not seem to be an issue among workers, such a commission may seem strange. But as I mentioned in my last letter, unions here are extremely concerned about the potential job loss which can be caused by the large-scale introduction of technology.

A meeting of 17 unions representing workers across the board, blue- and white-collar, condemned the Myers Report. There was a feeling that it was a palliative to the union movement to make new technology more acceptable.

Visiting executives from Data General Corp. expressed astonishment that such a concern prevails here. "No jobs are lost by the introduction of technology," according to vice-presidents Barry Fidelman and Rowland Thomas. "Computers free people for other more productive tasks."



What better way to learn about the computing scene in other countries than to ask the editors of computer publications? Computerworld recently set up an information exchange with its sister publications, all published by CW Communications, Inc., to do just that.

The Myers Report advocated speedy introduction of new technology, which it said would promote new profit areas and thus generate more jobs (Australia's unemployed is more than 6% of its potential work force). Ironically, it also recommended provisions to cater to those displaced by the new technology. A "social safety net" provides for compensation payments, after retrenchment, of 60% to 75% of salary for between one and six months, depending on length of service. In addition, retraining was suggested (but not recommended) to be provided by the retrenching employer.

Should the government accept the recommendations of the report — and it does not have to (its record in implementing the recommendations of commissioned reports is not impressive) — then Australia's indigenous computer industry will get a much-needed shot in the arm. We import almost all our hardware and system software to the tune of \$500 million each year — mostly from the U.S. With our relatively tiny population of 14 million and the lack of venture finance, Australian entrepreneurs have been discouraged from developing a manufacturing industry here.

While the government espouses a "buy Australian" policy, it has done little to ensure there are any Australian machines to buy. So Catch-22 prevails: There are no machines to buy, so there's no money to develop machines which could be bought.

In 1949, Australian scientists of the Commonwealth Scientific Industrial Research Organization (CSIRO) a government statutory authority, developed one of the earliest potentially commercial computers. CSIRAC, as it was known, was claimed to be not the fastest machine in the world at the time, but the easiest to program (that was foresight).

"It was easier to program even than Edsac. The language we devised was much more flexible and used considerably fewer instructions," recalled Dr. Trevor Pearcey, who did the logical design of CSIRAC.

But limited finances and a philosophical decision to put what money there was into radio astronomy sadly deprived us of our own computer industry from the outset. Even now there is only one company, CMAD Pty. Ltd., which actually manufactures a processor (a 16-bit computer). All other "manufacturers" buy processors from overseas and add value with software and a little homegrown hardware.

Compare this paltry effort with Sweden's LM Ericsson, which is contracted to supply \$1,200 million dollars worth of computerized telephone exchanges to the Australian telecommunications authority, Telecom. Sweden has a population about half the size of Australia's.

When Australia launches its domestic satellite in 1984, the satellites and the launch will all be supplied by foreign companies — \$200 million added to our national debt.

Attempt to Lead

The 1,500-page Myers Report urges the industry to "keep up with world technological development and where possible, in areas of particular advantage, attempt to lead." As well as defining the means by which venture capital could be made available, the report recommends that the Australian Industrial Research and Development Incentives Board (AIR and DIB) be restructured to become more autonomous and to have its charter expanded to include funding of public interest projects. The AIR and DIB is a government board which grants money for research and development projects on a dollar-for-dollar basis.

Suggesting, as a possible model, the West German venture capital bank Deutsche-Wagnesfinanzierungs-Ge-

ellschaft (WFG), which is a limited company funded by banks and other credit institutions and the government, the report recommends the establishment of a venture capital corporation "to provide risk capital to individuals and to small and medium-sized enterprises to facilitate the bringing to production and the marketing of promising inventions and innovations."

"The government contribution to the establishment of the corporation should include guarantee of loan funds up to a maximum of \$25 million over 15 years.

The Myers Report sets out to provide a means to reduce union opposition while providing financial incentives to get technology introduced as fast as possible. There is little attention to the side effects of its introduction.

The Myers committee was reluctant to put a figure on the proportion of those presently unemployed, although it conceded some were attributable to technological change. Nor was it prepared to say what the anticipated job loss of the future might be — although it had calculated that it should allocate \$15 million to \$20 million for short-term retrenchment payoffs to those who might not find another job before leaving their old ones.

Among the recommendations designed to reduce union resistance to technology are:

- To provide between one and six months' retrenchment payments at a percentage (60% to 75%) of weekly earnings and "assistance to find alternative employment."

"An employee's perception of what support he will receive after retrenchment can greatly affect his or her attitude to accepting or rejecting technological change," the report said.

- To lower barriers to union amalgamation and to deregister unions with less than 1,500 members.

- To provide for wage margins that more properly reflect skills and responsibilities via broadbanding job classifications into groups within awards.

- To upgrade, via a "bureau of the working environment," work environments to make them more pleasant and more safe as well as to enhance the quality of work through attention to factors such as organization of work and patterns of work time.

- To consider a means whereby payroll tax might be abolished (to encourage employers to hire more and fire less).

- To set up a technology awareness program to promote technological change and its effects on the economy, industry, the labor force and society.
- To enhance the capacity of the union movement to study and respond to technological change.

It is extremely disappointing to find that the committee did not even theorize on job training and creation schemes to assist these people — blandly assuming these aspects will take care of themselves. The 460,000 unemployed attest to the fact that this simply does not happen.

After 16 months and \$1 million, the report contains mainly suggestions for more reports, more surveys, more subcommittees.

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Report Outlines Four Phases Of Graphics Implementation

WASHINGTON, D.C. — If your firm is among those leaping on the computer graphics bandwagon, it will probably go through four phases during the process, according to Allan Paller, president of AUI Data Graphics here:

- Review of the alternatives.
- Preparation of a plan and hardware/software selection.
- Selling the plan within the organization.
- Implementing the system with training and support.

But, what will make computer graphics implementation both effective and successful? The four phases can be subdivided into a step-by-step process with each of the outlined steps having undergone the test of actual implementation, Paller claimed.

These steps are detailed in a study entitled "Ten Steps to an Effective Automated Business Graphics System."

Coordinator Selection

First, the organization must survey the available options, according to the study. It suggested selecting a coordinator to spearhead this effort with a small task force assigned to review progress. Classroom training in computer graphics and reviewing the graphics implementation experience of other similar organizations are among AUI's suggestions for the coordinator at this point.

Step 2 involves arranging preliminary hardware demonstrations and software briefings for the task force so that a consensus can be reached on the best approach to graphics implementation, the study continued.

In step 3, which begins the second phase in the implementation process, a plan that includes the following components should be prepared:

- A summary of existing and potential graphics applications within the company and applications which have proven successful in similar organizations.
- An inventory of existing equipment and expertise within the organization.
- A set of hardware and software requirements.

George Will To Address Usita

CHICAGO — George F. Will, columnist and TV personality, will address the U.S. Independent Telephone Association's (Usita) 83rd national convention here Oct. 6-8. Awarded the Pulitzer Prize in 1977 for distinguished commentary, Will is probably best known for his participation on the weekly "Agronsky & Company" television panel.

Keynote speakers at the conference will also include Charles Brown, AT&T chairman. Other features of the convention are management seminars, an awards luncheon and tours of the Windy City.

Admission is free for Usita members and \$25 for nonmembers. Housing reservations and ticket information are available from Pam Sprandel at Usita, Suite 1201, 1801 K St. N.W., Washington, D.C. 20006.

- A concrete plan for a comprehensive training and technical assistance program.

At this point, the firm is ready to select its business graphics software, according to AUI's report. The firm recommended selection of device-independent software because of the greater flexibility afforded to the graphics end user if he decides to expand the graphics applications in his organization at a later date.

Firms that purchase software from the hardware manufacturer are often either limited to a very small number of applications or are forced to rewrite software when new graphics equipment is installed, AUI claimed.

The hardware selection step involves specifying how often graphics will be needed in the organization; what level of graphics quality will be required; whether hard copy, film or color slides are necessary; and the extent to which individual users require direct access to the graphics tools.

Phase 3 — selling the plan within the organization — is best accomplished by arranging customized computer graphics demonstrations for top-level management personnel, AUI pointed out. The demo should be rehearsed and arranged to avoid computer or communications malfunctions.

Hardware and software installation begins the fourth and last phase, AUI noted. Installation should be scheduled so that hardware is delivered to the end-user location approximately two weeks before the software installation team arrives, the report said.

Business Application

The firm also recommended implementation of a high-visibility business graphics application as soon as possible after the executive briefing had taken place. The client selected by the graphics coordinator for this first application should be the highest level executive in the user department.

In order to ensure the success of this application, the coordinator must determine a specific set of indicators which the client deems as important for monitoring performance in his area.

Next, manual sketches of the charts to be produced by the system are to be prepared for the client's review and approval, according to the study. Finally, the appropriate data is selected and the graphics programming is prepared.

Step 9 in graphics implementation requires the provision of training for the user community, the report said.

Lastly, acceptance of computer graphics throughout a company requires the availability of a technical support group to assist new graphics users with particular applications. This technical support should include access to communications experts and the graphics arts staff as well as programmers, AUI said.

In fact, the firm suggested that a non-programmer be included on the technical assistance team to demonstrate that computer expertise is not necessary for effective graphics utilization.

The booklet outlining these phases is available at no cost from AUI Data Graphics at 1701 K St. N.W., Washington, D.C. 20006.



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Handles \$30 Million Daily

Money Fund's System Keeps up With Cash Flow

NEW YORK — Each working day approximately \$30 million moves into and out of the \$1.8 billion mutual fund operated by The Reserve Fund, Inc. here, originator of the entire \$80 billion money fund industry.

"Customers will wire in funds one day and take them out the next. You can't get much more liquid than that," noted Bob Kaczorowski, the fund's director of systems de-

velopment.

"The Reserve Fund, unlike other mutual funds, is in business to manage clients' short-term cash, or working capital, by investing exclusively in short-term, high-yield liquid investments such as Treasury bills and certificates of deposit," he said.

The more liquid the funds — the more stress that's placed on the old equation that time equals money — the more vital

it becomes to provide a fast and reliable service.

"Competition in this business is tough and individual depositors and brokers alike expect us to be able to give them an instant report on the funds they have with us. If we can't tell them, they take their money out of the fund and go elsewhere," Kaczorowski said.

Transaction Processing

A computer system, not surprisingly, is a must for The Reserve Fund's day-to-day operations. Until last summer, the fund had relied exclusively on a single large-scale computer system linked to 32 online terminals to manage its activity.

Now, however, it is developing systems based around a transaction processing package called TPS 6 offered by Honeywell, Inc. on its small Level 6 computers.

The Reserve Fund has installed four Level 6s at a cost of approximately \$1.2 million and has a fifth on order for delivery early next year.

"We looked at the market for an easy-to-use software package that would help us to implement transaction-based systems speedily. Further, we liked the backup that several small computers provide and the flexibility of being able to bring in another computer system if we want to start another mutual fund," Kaczorowski said.

"For a company that saw its asset base go from \$180 million to \$2.1 billion over a 22-month period, flexibility is an important consideration."

Using the TPS 6 system, The Reserve Fund is able to do concurrent production and program development work. One Level 6 is dedicated full-time to production, two other systems are employed doing spot duty and acting as backup and the fourth system is used for applications programming.

Daily Update

The production system is currently handling about 5,000 purchase and redemption transactions daily against a data base of about 140,000 active accounts. Every day the fund's portfolio is evaluated and applied to every account in the system.

All purchase orders — by check, wire or transfer of funds — and all redemption orders are entered through terminals linked to the computer. Modifications to account status, such as address changes, are also entered in the same way.

Other terminals are used by customer service representatives to answer on-the-spot customer inquiries on their ac-

counts and balances.

At the same time, the computer maintains a complete history of transactions and produces the periodic and special reports such as those required by the state and federal governments.

The primary key to the account master file, which stores all shareholder information, is the account number. But the file can also be accessed by the customer's Social Security number, phone number or agent account number, either alpha or numeric.

"If a customer can't remember any of these, we're in trouble," Kaczorowski quipped.

All other computer files are linked by TPS 6 to the master account file. These include transaction history, change history, general mailing and agent mailing files.

Security Measures

Because of the importance Reserve Fund places on security, it has designed its own access security mechanism using features built into TPS 6. Each operator has an ID and password and is assigned a certain level of security that allows access to certain information only.

There is also a time-out feature to prevent information from being left on the terminal's visual display screen. Depending on the sensitivity of the information, it

will be displayed for a few minutes or just for a few seconds.

The screen data formatting capability of TPS 6 and the multiple key access to files and other features of the system, including recovery features as well as niceties like the time-out feature, have enabled The Reserve Fund to tailor computer systems to meet its requirements in an "efficient and effective manner against a tight time schedule," Kaczorowski said.

Three of the installed Level 6s have similar configurations, being Model 578 with 384K words of main memory, a commercial instruction processor with cache, three 256 M-byte disk drives and two magnetic tape units. The development system, which has ten terminals attached, is a smaller Model 43 system.

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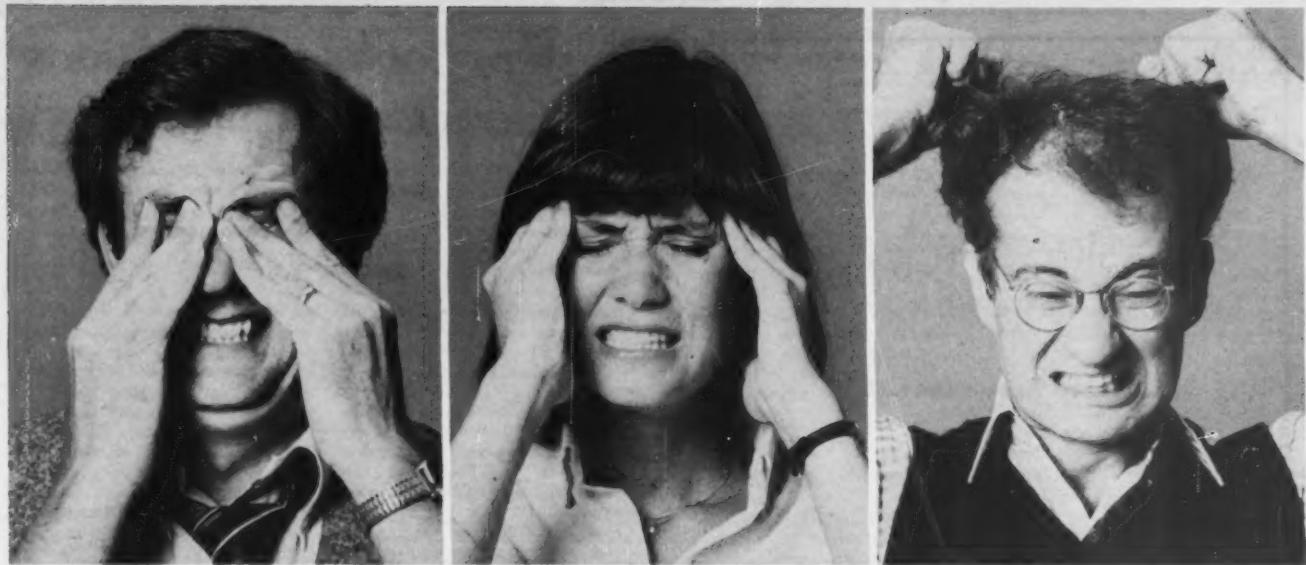
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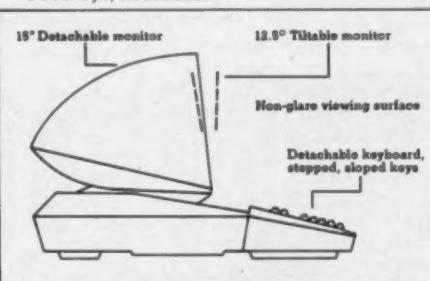
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display and locate them in any position you like. And the control base portion of the terminal can be remotely positioned out of the way.

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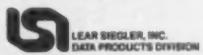
It also comes with a 25th line established and reserved for status indicators and messages of up to 78 characters.

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System Books Reservations For Condominium Vacations

SAN FRANCISCO — After five years in the works, Creative Leisure Corp. here has developed an electronic reservations system that offers travel agencies an effective way to book its resort condominium accommodations.

The firm, which was started in 1969, was founded to offer vacationers this alternative to hotel living. The company has 26 properties in Hawaii and 17 condominium resorts and villas in Mexico.

Six years ago, company president Peter Henze started looking for a hardware system that could provide to a smaller user the sophisticated functions usually required by larger companies.

Further, the firm deals with a range of products and a variety of customers. We needed software that could handle all facets of studio through three bedroom condominiums and sometimes, villas. But, we also needed something that could accommodate information useful to a budget-conscious family on vacation as well as a millionaire going away for a short trip," Henze said.

Datapoint Gets Nod

Henze decided on Datapoint Corp. and Creative Leisure has gone through a number of system upgrades ever since. In 1977, the firm installed a Datapoint 4520 with 48K bytes of user memory, 5M bytes of fixed and removable disk storage and a 132-char. printer, for development.

After two years of more system improvements and experimentation, the current software program was refined and put into operation with the Datapoint 4650. The current hardware offers almost three times the capacity of the 4520 with 120K bytes of main memory, and 120M bytes of disk storage attached to 11 on-line terminals, the firm said.

The software was designed by Henze, Creative Leisure systems analyst Mark Silverman and Datapoint systems engineers. Henze saw the need for a custom-designed program when the firm first switched to computer reservations, and found that existing software packages could not accommodate the company's needs, he said.

The current software can hold descriptive information, pricing and up to an 18-month availability for each unit of all the resorts and villas. It also can calculate applicable discounts, required deposits and the total price of the package, which may include additional variables such as airfare, rental cars and transfers from the airport. The system can calculate the total price of a package with a rental car based on type of car desired and number of people, the firm said.

In terms of travel agents, the company's primary liaison in booking reservations, the software offers agents a dollar breakdown of a tour package with agent commissions included. It also stores information on the client such as his name, ages of children, flight numbers, departure dates, itinerary and reservation number, which are then printed on a computer read-out and sent to both the agent and the resort manager.

Following the booking, the system keeps track of payment status, and document status — whether the confirmation, voucher and so on have been sent. The system also registers reservations and cancellations on the spot so availability is instantly updated.

Internal Applications

Another highlight of the system is its application to internal effectiveness. Software programming incorporates analysis reports on Creative Leisure such as accounting and auditing, management and marketing reports in which weekly revenue is broken down by area codes and regions per week. The number of rental cars and transfers is also listed for internal use.

In addition to all this, it produces productivity reports on reservationists and batch reports in which paperwork such as client invoices, vouchers and confirmations is done by the computer in the evening. Creative Leisure's reservation agents, therefore, can focus the whole of their time and attention to bookings and customer service, the firm said.

Recently, Creative Leisure was appointed an industry representative by Datapoint. Under the agreement, Creative Leisure is allowed to sell Datapoint's hardware in conjunction with its software and is the first company to be granted national sales rights, Henze noted.

Drug Molecules Modeled in 3-D

LAS VEGAS — Trying to guess how two molecules fit together without being able to see them is worse than groping for your housekeys in the dark — at least you know the shape of the keys and how they fit into your locked door.

But for years scientists have studied molecules without having any way of seeing how these tiny molecular building blocks stack together to make a drug work in your body.

Now scientists at the University of California-San Francisco's Computer Graphics Laboratory have developed some new computer programs that allow them to look at color 3-D models of molecules on a CRT screen. These moving models can be turned inside out and sliced into sections by a set of computer commands.

These new tools will allow researchers to look at many molecules that are part of proteins used by our bodies.

Four UCSF researchers explained their new techniques recently when they presented papers to their colleagues at the second Chemical Congress of the Northern American Continent. The congress was sponsored by the American Chemical Society.

"Color on the computer is a spectacular tool," said Robert Langridge, Ph.D., director of the Computer Graphics Laboratory at UCSF.

"It enhances the chemical intuition of scientists who are trying to visualize lock and key combinations, called receptor sites, that make the molecules of a drug interact with the molecules in the body."

Langridge and his UCSF colleagues, recently received a \$1 million grant from NIH Biotechnology to continue their work.

Envelope Design Eases Parish Donation Process

By Ken Halveland

Special to CW

ST. LOUIS — New collection envelopes with bright colored printing and wider top openings have eased donations for parishioner and processing for the staff at the St. Louis Archdiocesan Data Center here.

These envelopes enable parishioners of client churches to insert their donations for regular weekly collections as well as any special collections such as those taken on Holy Days. Sometimes during the year as many as nine or 10 collections are taken in a single month.

The original envelope was a rather plain continuous form having a side opening which made it awkward for the parishioner to handle. It required that the donation be folded in order to

insert it through the narrow opening. And its plainness tended to make it overlooked.

A Standard Register Co. specialist helped by designing a continuous envelope that had a wider top opening, was immediately more familiar to parishioners and certainly easier for them to handle. Colored inks screened on the basic white paper help people differentiate between regular collections and specials.

Depending on each church's requirements, the envelopes are printed with or without a return address with prepaid postage. Full instructions on how to handle the form are printed clearly and concisely.

Between 10,000 and 15,000 envelopes a month are processed on the

data center's computer and imprinted on each are the envelope number, week of use, parishioner's name, address, title (if any) and Zip Code.

After printing the margins are removed and the envelopes are detached from the continuous web on a Standard Register Series 1000 Forms Buster. They remain in the sequence in which they are to be used by a parishioner and in Zip Code order. They are then put through an inserting operation that places them in window envelopes ready for mailing.

Designed for Easy Handling

Parishioners return the envelopes with the donations either personally or through the mail. The forms have been designed so that they are equally easy

to handle by the church staff. Perforations below the flap seal and along the right side of the envelope enable parish committee personnel to open them quickly and easily. They note the amounts on the faces of the now empty envelopes and send these back to the data center.

A collection envelope may seem a small item on which to expend time and effort in making it more attractive and simpler to handle, but experience has shown that there is a lot of competition for attention and a document that stands out by reason of its appearance is more likely to get a bigger share of that attention.

Halveland is director of data processing for the St. Louis Archdiocesan Data Center.



Parishioner simply inserts money in envelope at the appropriate time and returns it to the church personally or by mail ...



... After the church has removed the contents of envelopes and marked the amount, the envelopes are returned to the data center for entry of information to the computer data base.

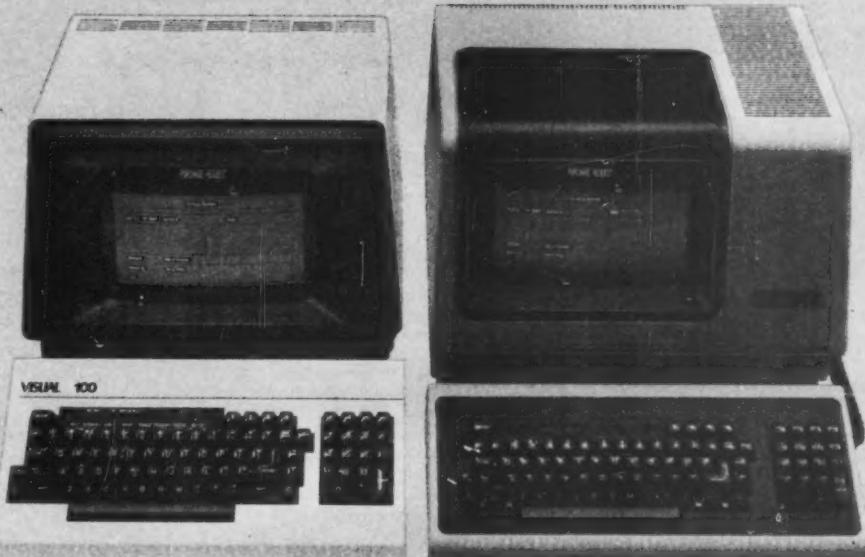
Comten User Meet Set For Houston Oct. 6-10

HOUSTON — CUE XV, a user-oriented computer convention sponsored by Comten Users Exchange, Inc., is scheduled to take place here Oct. 6-10.

The agenda includes sessions on performance measurement systems, NCR-Comten's data communications networking perspective, tech control systems, Software Release 63 with CNS trunking protocol alternatives, Comten NTO support and Remote MAF.

The fee is \$150 for the whole week or \$75 for Thursday-only admission. Detailed information is available from Marilyn Cianciolo, General Motors Research Labs, GM Technical Center, Warren, Mich. 48090.

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Managers on the Move



Richard Sigrist

RICHARD D. SIGRIST has been appointed manager, information systems, Analog Devices' Instrument and Systems Group in Norwood, Mass. He will direct the design and implementation of management information systems, as well as maintain financial control over operational costs.

Prior to the promotion he was a systems analyst at Analog. Sigrist joined the company in 1967. He has been employed in supervisory engineering positions with MIT, General Motors and ITT-Kellogg.

Sigrist has a B.S. degree from the University of Illinois and an M.S. in industrial management from Northeastern University.



Frances L. Chu

FRANCES L. CHU, department head of systems integration services for Chemical Bank, New York, has been named vice-president. She will be responsible for providing data base services, distributed and time-sharing systems services and office automation services.

Prior to joining Chemical as an assistant vice-president in 1973, Chu was an advisory marketing representative for IBM.

LEONARD H. FROEMEL will join SCI-PRO, Inc. as vice-president of operations. He is responsible for the design, development and production of hardware/software for SCI-PRO's transition from research and development to manufacturing operations.

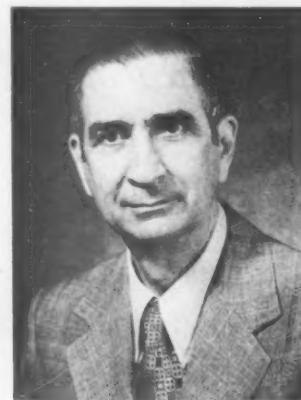
Prior to the appointment Froemel was manager of manufacturing at Hazel-

tine Corp. He has held senior manufacturing engineering and operations positions with Applied Digital Data Systems, Lux Corp. and Viewlex, Inc.

JAMES E. HUGHES has been appointed branch manager of Xerox Computer Services for Wisconsin, Minnesota and upper Michigan. He has been affiliated with Xerox since 1973, most recently as marketing manager of the Milwaukee branch.

Prior to joining the company, Hughes was vice-president of manufacturing, Zimmerman Brush Co.; director of information systems, Pettibone Corp.; and held programmer and systems analyst positions for Zenith Radio Corp. and Admiral Corp.

Hughes received his B.A. degree in mathematics and economics from Ripon College, Wisconsin.



C. Miles Fort Jr.

C. MILES FORT JR. has been named director of staff services for Libbey-Owens-Ford Co.'s management information services department. He will be responsible for system design and development, communications and time-sharing services, material coding, DP form design and control and evaluation of computer hardware and software packages.

Fort was a senior systems analyst before his promotion. He joined the company in 1941 holding posts at the company's Shreveport, La., glass plant before transferring to the executive office in Toledo, Ohio, in 1971.

He received a B.A. in business administration from Centenary College in Shreveport.

FREDERICK S. WOLFE has been promoted to director of management information systems (MIS) for the St. Regis Paper Co. He will be responsible for designing and operating all of the company's computer systems.

Wolfe joined St. Regis in 1960 as a management trainee in the Flexible Packaging Division's Columbus, Ohio, plant. He was named the division's DP manager five years later and, in 1969, entered the corporate MIS department as manager of the Dallas regional computer center. In 1977, he was named manager of MIS operations and information systems.

He received a B.S. degree in industrial engineering from Ohio State University.

DAVID H. BUTTERFIELD has been named director of information resources for Prime Computer, Inc., Wellesley Hills, Mass. He will direct planning, developing, maintaining and operating Prime's internal business and office systems.

Before joining Prime, he was director of systems at Gillette Corp. and prior to that held various sales, marketing management and consulting positions with IBM.

Butterfield received a B.S. degree in

industrial management from MIT and an M.B.A. degree from Washington University in St. Louis.

JOHN A. MARAGANIS has joined Data, Inc., a Burlington, Mass., consulting firm, as director of the information services division. He will be responsible for managing software projects, computer operations as well as being a technical consultant for the company.

Do the

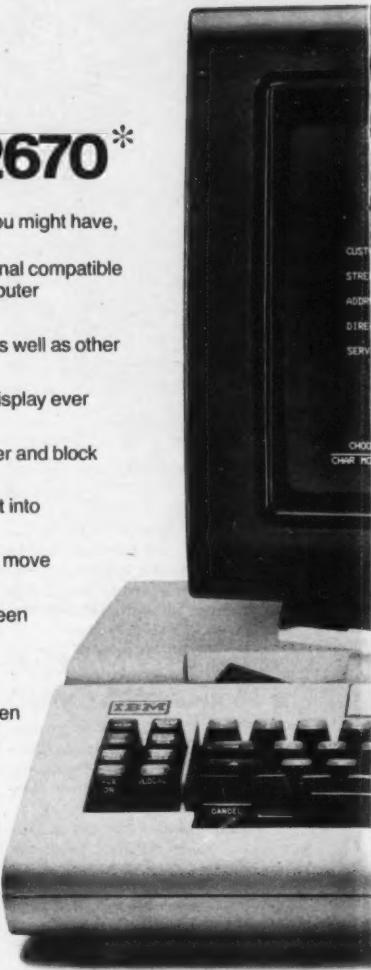
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*In New York call 800-942-1918.

The IBM 3101 ASCII terminal, priced

Managers on the Move

He is a graduate of New Hampshire College, with a B.S. degree in management information systems.

MARK G. HURWITZ has been appointed manager, DP operations for the Sheraton Corp. Hurwitz will be responsible for computer operations, data control and data entry.

Prior to joining Sheraton, he was associate director of administrative computer services at Northeastern University.

sity.

He holds a B.A. degree in economics and an M.Ed. degree in administration from Northeastern.

EUGENE BOYER has been named director of business and finance at the University of New Mexico Hospital/BCMC in Albuquerque. Prior to the appointment, he was director of DP at the hospital.

Before joining the hospital staff in

1979, he was a partner in Jeffrey L. Walker & Co. in San Francisco. Formerly he was a senior systems analyst with International Harvester Co. in Chicago and later joined Arthur Young & Co. in Los Angeles as a manager of its management service consulting practice.

The Pryor Corp. has promoted DENNIS S. OLES, manager, computer operations. He will be responsible for all

computer operations in the supply and services divisions.

Prior to the appointment, Oles was senior programmer. He joined Pryor in 1974 as a programmer/analyst.

ANDREW NICHOLS III has been named manager, information processing services, for the corporate DP department of Rexnord, Inc., Milwaukee. He is responsible for computer operations, key entry and data control.

ASCII two step



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Model 13	RS-232 & RS-422 point to point	\$1320
IBM 3101 Display - Block Models		
Model 20	RS-232 point to point	\$1495
Model 22	RS-232 point to point/20MA current loop	\$1520
Model 23	RS-232 & RS-422 point to point	\$1520
Model 01	IBM 3102 Printer	\$1295
ACCESSORY		
	Modem Cable	\$65

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Network Keeps Landscaping Dealer Posted

PORTRLAND, Ore. — At Alfred Teufel Nursery, Inc., a West Coast wholesaler of nursery products and landscaping supplies, several hundred over-the-counter orders per day result in instant invoices, instant customer account posting and instant inventory updates.

"We're among the 10 largest nurseries on the West Coast, and I believe in having up-to-the-minute information," Tom Teufel, vice-president of the family-owned corporation, said. "I think our invoicing operation is

unique in our industry."

At the Portland nursery and its branch in Seattle, over-the-counter orders are keyed on CRT terminals online to a mainframe. Following credit checks, the computer sends back invoice header data, line item extensions, totals and discount data for immediate output on printing terminals and presentation to the customer.

At the same time, the computer updates inventory files, handles account posting and — when appropriate — generates purchase orders for replen-

ishing inventory.

The company, formed four generations ago by Gustav Teufel, supplies more than 3,000 landscaping, building and gardening customers across the nation with over 15,000 items ranging from pine trees and rhododendrons to gardening tools and fertilizers. The company sells on a wholesale basis only.

The nursery is located on 100 acres used to grow holly, pine, maple, spruce and a number of other trees, as well as a variety of shrubs. The Seattle branch is located on 20 acres that is also used for stock and growing products. Teufel said the Burroughs Corp. B1855 in Portland is on-line to the Seattle branch via data sets and full-time leased lines to a second AP 310 printing terminal and a number of TD 830 CRT terminals.

The B1855, together with a network of TD 830 CRT terminals, also handles all transactions related to the company's accounts payable and receivable applications.

Expansion Planned

The company intends to expand use of the B1855 in the near future to handle payroll applications and to institute two new inventory control systems to monitor hard goods supplies. According to Teufel, the B1855 presently han-

dles inventory systems for out-of-state orders, local orders and future orders. The company will institute controls for tool and fertilizer inventories, bringing the total number of inventory items managed by the computer to 35,000.

The nursery has been using Burroughs equipment and software since 1968, when it first entered data processing using a Series L3000 minicomputer. The L3000 was replaced by a B800 computer in 1977; the nursery purchased the B1855, valued at approximately \$145,000, last October because it wanted a system that has full audit and recovery capabilities while being able to manage an extensive on-line terminal network.

"Burroughs equipment has always performed well for us. It is very reliable and easy to use. In fact, our main computer operator used to work as a shipping dock foreman with no previous computer experience," Teufel noted.

The B1855, which has 512K bytes of main memory and 65M bytes of expandable disk pack storage, is using a number of Burroughs program products. These include Network Definition Language, Message Control System (MCS), Data Management System II, Data Management System Inquiry and the Command and Edit language.

Air Canada Loading System Gives Vital Preflight Calculations

NEW YORK — In an effort to obtain better fuel efficiency and more streamlined service, Air Canada is introducing its Automated Load Planning System (Alpac) to 10 of its 12 Caribbean stations.

The system was designed to help load agents ensure that an aircraft's luggage and cargo are balanced as evenly as possible before each takeoff. That process is a delicate one and must be kept within established limits.

Previously calculated by hand using charts, forms and graphs, the job has been performed with the use of a computer keyboard since July — much to the approval of load agents, according to Air Canada.

System Features

Alpac works hand-in-hand with the automated flight planning computer so that total fuel load and individual tank requirements can be established.

With the system, all information on boarding freight can be input directly

from the flight terminal and all load message information to the succeeding station can be collected and automatically transmitted to the next station. Passenger load information can also be automatically input at stations which are equipped with the automatic seat-selection device.

If the projected load plan goes beyond limits, the computer will refuse the input, and the agent is referred back to the point at which he must start replanning the load.

This system of surveillance and alert remains in place until the final figures are collected and given to the captain of the aircraft.

"The process has been accepted by all load agents as being very important to the accomplishment of optimized trim," reported Barry Blight, Air Canada's aircraft services manager for the U.S. and Southern Region.

"It is also looked upon as an important technological advancement in the industry," he added.

Group Ready for 370 on a Chip

MT. SHASTA, Calif. — Mokurai Cherlin of APL Business Consultants, Inc. believes the long-awaited single-chip computer with the IBM 370 instruction set is just over the horizon, so he has formed Group/380, an interest group that gathers information that will help people figure out what to do with the new system when it arrives.

Cherlin claims there are no serious problems left in developing such a system. He cited *Datamation* report stating that IBM, Intel Corp. and Motorola Corp. have already put

the 370 instruction set on a chip. It is now only a question of waiting for it to go into production.

His group's initial plan is to prepare the way for 370-compatible micros by accumulating all relevant information. The software data base is thought to be the most important part of this preparation.

Membership in Group/380 is \$10 for individuals and \$25 for corporations and groups. More information is available from APL Business Consultants, Inc., P.O. Box 1131, Mt. Shasta, Calif. 96067.

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Outline of Terms of Purchase. IBM 3101 and IBM 3102 Machines.

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The prices shown on the order form on the reverse side (Order Card) and these terms are subject to change until IBM confirms your order in writing (order confirmation). At that time, you will be given the full terms governing this purchase including any changes to the prices and terms shown here. In the event of any change, you may cancel the order within 10 days without liability by written notice to the DPD Marketing Center. Otherwise, the prices and terms provided at the time of confirmation will apply to this order.

Payment is due 15 days after the Date of Installation. The Date of Installation of the machines is deemed to be two days after the date of receipt by the Customer. In addition to the purchase price of the machine, the Customer agrees to pay all applicable taxes and shipping charges.

INSTALLATION

The Customer is responsible for unpacking, checking out and setting up these machines.

TITLE AND RISK OF LOSS OR DAMAGE

The title to each machine passes to the Customer on the Date of Installation. Up to and including the Date of Installation, the risk of loss or damage will be borne by IBM. Thereafter, risk of loss or damage will be borne by the Customer.

15-DAY TRIAL

The Customer may order the first five IBM 3101's and the first five 3102's on a 15-day trial basis. If, for any reason, the Customer is not satisfied with these machines, the Customer may return the machines and pay only shipping charges to the Customer's location. To return the machines, the Customer must notify the DPD National Marketing Center within 15 days from the Date of Installation and pack the machines in their original shipping cartons. IBM will arrange for their return to IBM.

WARRANTY

IBM warrants that each machine will be in good working order on the Date of Installation and that it will conform to IBM's official published specifications.

For three months commencing on the Date of Installation of each machine, IBM agrees to provide at no additional charge to the Customer, warranty service at an IBM Repair Center to restore the machine to good working order.

DETAILS OF THIS WARRANTY, AND EXCLUSIONS FROM WARRANTY SERVICE, WILL BE PROVIDED AT THE TIME OF ORDER CONFIRMATION.

SHIPMENT

IBM will provide the estimated shipment schedule for this order in writing at the time of order confirmation. IBM reserves the right to amend the estimated shipment schedule as necessary.

INFORMATION ON PATENT INDEMNITY, LIMITATION OF REMEDIES AND OTHER GENERAL PROVISIONS WILL BE PROVIDED AT THE TIME OF ORDER CONFIRMATION.

I have read the above and understand that my order is subject to prior credit approval, that the full terms governing my order will be sent with IBM's confirmation letter and that unless notified otherwise, shipment will be made within 45 days of receipt of order.

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The federal government has indicated that factory and office productivity are declining—contributing not only to inflation, but to a weakening of our competitive strength in the world market as well."

Are you aware that declining productivity is quickly becoming one of our nation's biggest problems?

Find out about this important issue, and what you as an information specialist can do to improve productivity within your own organization.

Plan to attend

IDC International Data Corporation's Fall Executive Conference

Improving Information Processing Profitability and Productivity in the 1980's

October 19-22, 1980—Hotel del Coronado, San Diego

Sunday, October 19th

Early Bird Session!

A panel discussion made up of leading technologists from the semi-conductor, software, systems, and input/output areas will bring Conference Attendees up to a common level of knowledge regarding technology's contribution to improvement in productivity of computer and office systems.

Monday, October 20th

The Dimensions of the Productivity Problem and Possible Hardware Solutions

Kicking things off will be the day's KEYNOTE SPEAKER, Dr. John Hogan, Vice President, Research, American Productivity Center—an organization devoted to improving U.S. business and organizational productivity. Dr. Hogan will inform Conference Attendees on where the U.S. fits in the productivity spectrum; how MIS can contribute to better productivity and how to identify productivity commended within your organization.

Other topics/speakers for the day:

Managing Information Resources for Greater Productivity—Barry Stevens, Performance Management Associates, Editor, "EDP Performance Handbook."

Leading User Experiences—Len Shea, President, Computer Resources Management.

PANEL DISCUSSION: Hard Versus Soft Productivity

- Chairman: Will Zachmann, Research Director, Information Systems Planning Service, IDC.
- Software vendor—(Boole & Babbage)—to be announced.
- Hardware vendor—Asa Lanan, Vice President Software, Ardent.

PANEL DISCUSSION: Comparing Large Mainframe, Mini or Distributed Productivity

- Ray Smith, Senior Vice President, Miradota.
- Vaughn Hysinger, Director, Software Support, Four Phase Systems.

Programming Productivity Enhancements—Dr. Keith Uncapher, USC Information Science Institute.

Capacity Management & Planning—Diane Fazel, Director of Marketing, Institute for Software Engineering.

SPECIAL FEATURED SPEAKER:
Improving Productivity Through Systems Planning—John Zachman, Industry Consultant, IBM Corporation.

Tuesday, October 21st

The People Problem: Improving Productivity via Human Resource Management

KEYNOTE SPEAKER for the day's session will be Ira Goffried, the well-known MIS consultant from Los Angeles. Mr. Goffried, who has his own consulting organization, is a specialist in internal planning and human resource management. He'll describe how the "new breed" EDP professional differs from the old style DP pioneer; how this affects the selection process; and the career paths open to DP professionals in the 1980's.

Other discussions for the day to include:

Dr. Robert A. Zawadzki, Associate Professor, University of Colorado, and Dr. Dan Couger—co-authors of a new study on "Personal Development and Productivity Improvement in DP".

Improving Application Software Quality—Wayne Smith, Vice President, Applied Information Development, Inc.

WRAP-UP SESSION by Dr. Werner Frank, Executive Vice President, Informatics. Dr. Frank, one of the pioneers of the software industry, will examine "The New EDP Economics: People/Software Tradeoffs." One of the main thrusts of his presentation will be a look at the growing packaged software industry as an alternative to expensive in-house development.

Wednesday, October 22nd

KEYNOTE SPEAKER for the final day's sessions will be Kent Black, President of Rockwell Corporation's Electronic Systems Division. Mr. Black will spell out what a chief executive expects from the information systems professional in the 1980's: how "friendly systems" are allowing top executives to interact directly in information processing; and how top managers can make more productive use of their own time.

Other presentations will include:

PANEL DISCUSSION: Building Systems More Friendly to the User in Office/Administrative Environment and More Economical to MIS

- Chairman: Thomas Sinapoli, Director, Automated Business Communications Program, IDC.
- Lawrence Burden, Director, MIS Services, Northwest Industries.
- Vendor Discussion—Bob Bond, Marketing Manager, Hewlett-Packard 3000 Series.

This Conference, one of two IDC conducts each year, will look at the productivity problem from the standpoint of the information resources manager. While computer and office systems can go a long way toward improving productivity, careful planning of all the resources at hand—systems, people, and procedures—is absolutely necessary for success. Presentations by top vendors and leading-edge users will provide IDC Conference Attendees with insights on new products (both hard and soft), information on new technologies, and examples of successful case histories.

Cost and Registration Procedure:

The Conference registration fee is \$750. Additional persons from the same organization may attend at the reduced rate of \$495. For a complete registration packet, contact the IDC Conference Coordinator—and use our toll-free number: **800-225-8952**.

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Hamming's Technique Of Error Correction Marks 30th Birthday

MURRAY HILL, N.J. — It was simple human frustration that led Dr. Richard W. Hamming, then a research mathematician at Bell Laboratories, to devise the first method for correcting machine-caused errors in digital computers back in 1950.

Hamming's technique — a result of his research in pure mathematics — enabled computers to spot electrical errors in the data and instructions and tell where they occurred. And, for the first time, it enabled computers to correct those errors and go right on solving problems without interruption.

This year marks the 30th an-

niversary of Hamming's development of error-correcting codes. Besides aiding the computer industry, the codes are also essential to call-processing accuracy in the Bell System's No. 1 ESS (electronic switching system).

Early Frustration

Hamming's frustration came about because early computers would simply stop operating whenever they detected an error.

"I knew that if the computer was smart enough to detect an error and shut itself off to prevent false answers to the problem, then it could be made smart enough to correct that



Thirty years ago, at switchboard of apparatus (left), whose mathematical research made the apparatus possible, and Bernard Holbrook, under whose direction it was built.

error and continue computing," Hamming recalled recently.

In time, Hamming devised a method using a combination of several odd-even checks to identify precisely the position of the error and make the correction. Apparatus incorporating Hamming's mathematical discovery was constructed under the direction of Bernard D. Holbrook, then a Bell Labs switching research engineer.

In the early days of computers, errors usually were caused by faulty relay contacts, open circuits, false grounds or disturbances induced by outside sources. Today, even with the advent of solid-state components, extraneous signals still find their way into the individual transistors and other electronic devices to cause potential errors.

The error-detecting and correcting capabilities of Hamming's codes are provided as part of the processor hardware of the Bell System's No. 1 ESS.

At year-end 1979, there were more than 900 such systems across the country serving almost 19 million customer lines. Hamming codes are also used in Bell System electronic tandem switches and in electronic long-distance operator consoles.

Effectiveness Shown

The effectiveness of Hamming's codes was demonstrated during the 1960 trial of the world's first ESS at Morris, Ill. A small piece of wire fell across two terminals of one program memory while the duplicate memory was out of service. This resulted in the possibility of 33,000 call-processing mistakes per second.

It took Bell maintenance personnel nearly an hour to find the tiny wire. However, not a single call was misdirected because Hamming's codes auto-

matically corrected each of the thousands of errors the machine made each second.

Bell Retiree

Hamming joined Bell Labs in 1946, specializing in the use of numerical methods for solving problems on large-scale computing machines. A Bell Labs retiree, Hamming now teaches mathematics and computer science at the Naval Post-Graduate School in Monterey, Calif.

He is past president of the Association for Computing Machinery (ACM) and in 1968 was elected Turing Prize Lecturer of the ACM. In 1979, he received the Piore Award of the Institute of Electrical and Electronics Engineers.

Hamming was recently elected a member of the National Academy of Engineering. His latest book, entitled *Coding and Information Theory*, was published this year by Prentice-Hall, Inc.

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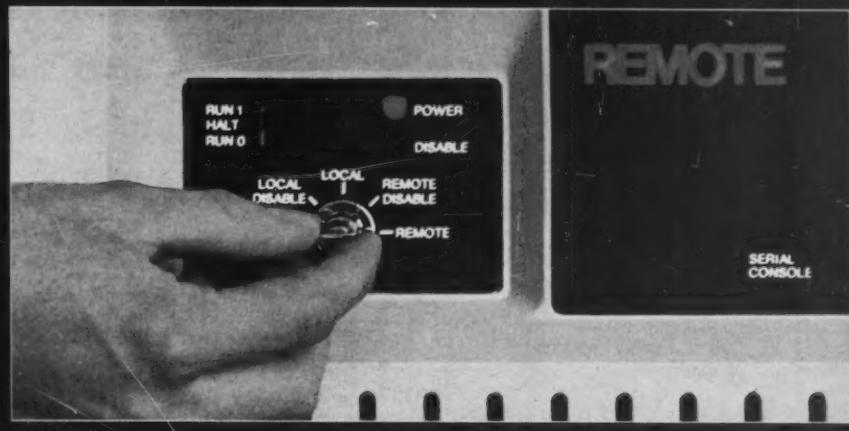
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goes beyond troubleshooting. It pinpoints potential problems while they're still merely potential.

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Calendar

Sept. 30 - Oct. 1, Pittsburgh, Pa. - **User's Guide to Systems Development.** Contact: BSI, 4720 Montgomery Lane, Bethesda, Md. 20014.

Oct. 6-9, Tokyo - **Eighth World Computer Congress.** Contact: Afips, 1815 N. Lynn St., Arlington, Va. 22209. Also being held Oct. 14-16 in Melbourne, Australia.

Oct. 5-10, Anaheim, Calif. - **Meeting of the American Society for Information Science (ASIS).** Contact: ASIS, 1010 16 St. N.W., Washington, D.C.

20036.

Oct. 6-7, Minneapolis - **Conference on Local Computer Networks,** sponsored by the Institute of Electrical and Electronics Engineers. Contact: Dr. Abe Franck, USS: University of Minnesota, 227 Experimental Engineer, 208 Union St. S.E., Minneapolis, Minn. 55455.

Oct. 6-7, San Francisco - **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville,

Md. 20854.

Oct. 6-7, San Francisco - **Software Cost-Estimating.** Contact: Data Processing Management Association Education Foundation, 505 Busse Highway, Park Ridge, Ill. 60068. Also being held Oct. 27-28 in Los Angeles.

Oct. 6-7, New York - **How to Sell Data Processing Products and Service More Effectively.** Contact: New York University Management Center, 360 Lexington Ave., New York, N.Y. 10017.

Oct. 6-8, Chicago - **Data Communications: Effective Network Design.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Oct. 29-31 in Chicago.

Oct. 6-8, San Francisco - **Automating Your Office Today: Planning and Implementation Methods.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 6-10, Newport Beach, Calif. - **Structured Systems Analysis and Design.** Contact: Improved Systems Technologies, Inc., Suite 4500, 888 Seventh Ave., New York, N.Y. 10106. Also being held Oct. 20-24 in Chicago.

Oct. 8-10, Washington, D.C. - **Introduction to Micro/Personal Computer: Applications, Selection and Usage Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Oct. 20-22 in Los Angeles.

Oct. 9-10, Chicago - **Midwest User's Group Meeting,** sponsored by Nixdorf Computer Software Co. Contact: Computer Software Co., 6517 Everglades Drive, Richmond, Va. 23225.

Oct. 6-10, Houston - **Structured Data Base Design.** Contact: Improved Systems Technologies, Inc., Suite 4500, 888 Seventh Ave., New York, N.Y. 10106.

Oct. 6-7, Syracuse, N.Y. - **Successful Selection of Minicomputers,** sponsored by the Canadian Institute of Charter Accountants. Contact: RHY Consultants, Inc., P.O. Box 21026, St. Paul, Minn. 55121. Also being held Oct. 20-21 in San Francisco.

Oct. 6-7, Washington, D.C. - **Basic Data Communication.** Contact: Atlantic Research Corp., 5390 Cherokee Ave., Alexandria, Va. 22314.

Oct. 6-7, Philadelphia - **Microprocessing for Managers.** Contact: American Institute for Professional Education, Carnegie Building, Hillcrest Road, Madison, N.J. 07940. Also being held Oct. 20-21 in Los Angeles.

Oct. 6-8, Topeka, Kan. - **Structured Systems Design User's Conference.** Contact: Langston, Kitch and Associates, Inc., 715 E. 8 St., Topeka, Kan. 66607.

Oct. 6-8, Seattle, Wash. - **Data Communications Network Design.** Contact: Institute for Science and Public Affairs, 1370 Ave. of the Americas, New York, N.Y. 10019.

Oct. 6-8, Los Angeles - **Inquiry IV/IMS User Group Meeting.** Contact: Informatics, Inc., 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Oct. 6-8, Washington, D.C. - **Configuration Management.** Contact: George Washington University, School of Engineering and Applied Science, Washington, D.C. 20052.

Oct. 6-8, Hartford, Conn. - **Computer Controls.** Contact: RHY Consultants, Inc., P.O. Box 21026, St. Paul, Minn. 55122. Also being held Oct. 20-21 in Los Angeles.

Oct. 27-29 in Honolulu.

Oct. 6-8, Chicago - **U.S. Independent Telephone Association (Usita) Conference.** Contact: Usita, Suite 1201, 1801 K St. N.W., Washington, D.C. 20006.

Oct. 6-8, Toronto - **APL Users Meeting.** Contact: I.P. Sharp Associates Ltd., 145 King St. W., Toronto, Ont., Canada M5H 1J6.

Oct. 6-9, New York - **CICS/V5 Application Design.** Contact: On Line Software International, 65 Rt. 4 E., River Edge, N.J. 07661.

Oct. 6-9, Boston - **Senior Project Management.** Contact: American Management Associations, 135 W. 50 St., New York, N.Y. 10020. Also being held Oct. 27-30 in Los Angeles.

Oct. 6-9, Anaheim, Calif. - **Computer-Aided Design & Manufacturing.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

Oct. 6-9, New York - **Information Management Exposition and Conference.** Contact: Clapp & Poliak, Inc. 245 Park Ave., New York, N.Y. 10017.

Oct. 6-10, Orlando, Fla. - **Sperry Univac's Series 1100 User Meeting.** Contact: USE, Inc., Box 461, Bladensburg, Md. 20710.

Oct. 6-17, Tokyo and Melbourne, Australia - **International Federation of Information Processing Societies (IFIP) Congress 80.** Contact: IFIP Congress 80, G.P.O. Box 880G, Melbourne, Victoria, Australia, 2001.

Oct. 7, Boston - **Data Catalogue Update.** Contact: Synergetics Corp., One De Angelo Drive, Bedford, Mass. 01730.

Oct. 7-9, Houston - **Managing the DP Professional - the Challenge of the '80s.** Contact: UBI Enterprises, 30 Milbank Ave., Greenwich, Conn. 06830.

Oct. 7-9, Mayaguez, Puerto Rico - **Financial Planning and Control in the Small and Medium-Sized Business.** Contact: Arthur Andersen & Co., Center for Professional Education, 1405 N. Fifth Ave., St. Charles, Ill. 60174.

Oct. 7-9, Hong Kong - **Advanced Auditing.** Contact: Arthur Andersen & Co., Center for Professional Education, 1405 N. Fifth Ave., St. Charles, Ill. 60174.

Oct. 7-9, Los Angeles - **Introductory APL.** Contact: STSC, Inc., 11 Clearbrook Road, Elmsford, N.Y. 10523. Also being held Oct. 7-10 in Madrid, Spain.

Oct. 7-9, Philadelphia - **Project Management & Control.** Contact: Q.E.D. Information Sciences, Inc., 180 Linden St., P.O. Box 181, Wellesley, Mass. 02181.

Oct. 7-10, San Francisco - **Information Industry Association (IIA) Conference.** Contact: IIA, Suite 502, 316 Pennsylvania Ave. S.E., Washington, D.C. 20003.

Oct. 8-10, Washington, D.C. - **Introduction to Teleprocessing Software.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Oct. 20-22 in Chicago.

Oct. 9-10, San Francisco - **Managing Software Projects.** Contact: Data Processing Management Association Education Foundation, 505 Busse Highway, Park Ridge, Ill. 60068. Also being held Oct. 20-21 in Los Angeles.

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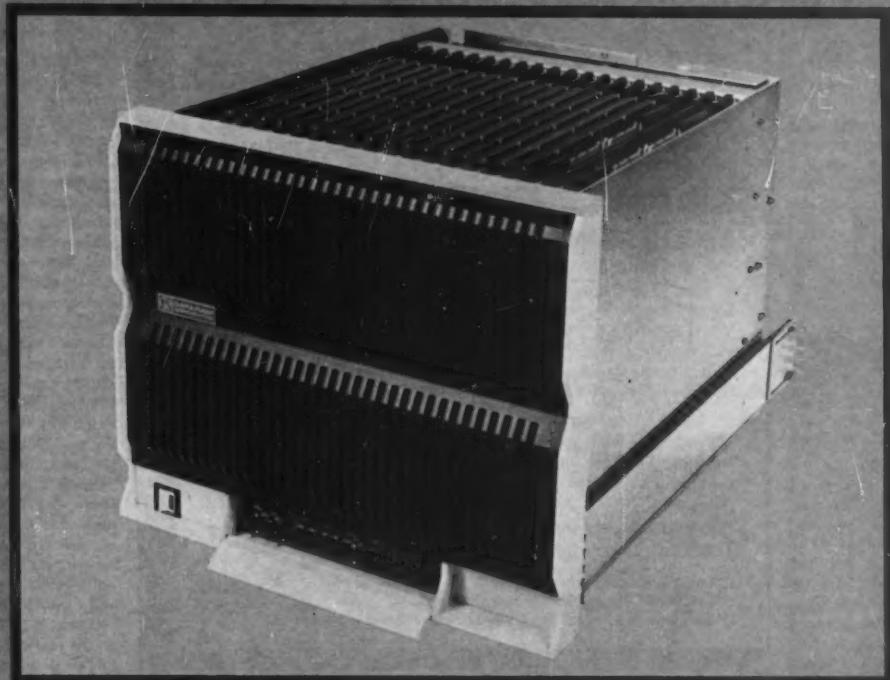
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In Scientific/Engineering Problem

Vector Graphic System B Better Than Average

By Hillel Segal

Although it was one of the least expensive computers benchmark tested so far by the Association of Computer Users, the Vector Graphic, Inc. System B turned in a credible performance. In spite of its low cost, it gave a better than average showing on some tests.

Compared with other computers priced less than \$15,000 tested so far, the System B's time of 19:30.0 in the scientific/engineering problem was about 2% better than the six-system average. In the CPU-intensive test, it scored about 18% better than average.

In the accounts receivable problem, the System B's time of 5:56.5 fell below the group average of 4:15. All tests were run on standard programs written in Basic. The differences in time reflect the relative performance which could be expected under actual working conditions, at least when similar software was used within the Basic environment.

Qume Printer Included

While the run-times obtained during benchmark testing of the System B are unspectacular, the inclusion of a 55 char./sec Qume Corp. daisy-wheel printer in the total price of \$7,750 is unusual. That component alone sells for about \$3,000, and if a less expensive dot-matrix character printer were substituted, the package price would likely fall below \$6,000, making the System B the most economical small computer tested. In actual practice, a variety of printers are used with the System B. The Qume would normally be included only in a system designed for word processing (WP).

Other elements of the system include a central processor, 64K bytes of memory, two double-sided dual-density 5.25-in. diskette drives, a CRT terminal and the operating system and language. The diskettes are made by Micropolis and store 315K bytes of formatted data each. An additional pair of drives may be added to expand the system to a total of 1.26M bytes.

Because the System B uses a Z80A processor, S-100 bus and CP/M operating system, an almost endless variety of special-purpose circuit boards, languages and applications are available from outside vendors. Vector Graphic also provides quite an array of options, and the System B configuration is intended to present potential users with a practical, low-cost combination.

The processor hardware is housed in a small unit which fits on or under a tabletop. A separate terminal supplied with the package has a conventional 24 line by 80 char. screen. The terminal was noted by users for its high-quality keyboard: "It feels like you're typing on a typewriter, not a computer," one person surveyed remarked.

Those using the Qume printer were happy with the print quality, which approaches that of a good electric typewriter. It offers interchangeable fonts and prints in several pitch settings. But its speed is not equal to that of a conventional matrix printer, and it is much noisier. Vector Graphic now reportedly offers its own 150 char./sec dot-matrix printer, and for most applications other than WP, it would be the obvious choice.

SCOREBOX

System: Vector Graphic System B

Current Price: \$7,750

Series 1 Results***

Systems up to \$15,000

Pertec PCC 2000
North Star Horizon
Cromemco System Two
Texas Instruments 771
Vector Graphic System B
Decstation 78

C-1 C-3

Scientific-/Engineering Time
Accounts Receivable Time

28:48.4
12:01.9
14:52.6
22:05.4
19:30.0
To be covered in next issue

Series 2 Results***

Systems \$15,000 to \$25,000

IBM 5110
Wang 2200VP
Texas Instruments FS990/10
Hewlett-Packard System 45
DEC PDP-11VO3
Q1 Lite
Univac BC/7-610
Northern Telecom 405
Datapoint 1170
Randal 100
Hewlett-Packard 250
Texas Instruments DS990/2

C-1 C-3

29:47.2
2:05.8
*
4:38.9
14:43.4
6:50.7
12:09.2
*
38:27.5
13:52.4
4:05.9
*
4:11.0'
3:20.0'
3:18.6'
5:05.8
4:14.0
5:03.3
10:37.0
**
6:50.4
10:05.0
4:45.7
2:48.3

*Test could not be run because of memory limitations.

**Test could not be run because of formatting limitations.

***Both Series 1 and Series 2 were run on the same programs.

We tested the System B with the CP/M operating system and Microsoft Basic-80, but other combinations are possible. Vector Graphic offers the Mzos and Mdos operating systems by Micropolis. Languages available include C-Basic, M-Basic, Pascal, APL, Fortran, Cobol and assembler.

In addition to these languages, Z80

The Basic-80 language used for the tests has a number of extra features worth noting. It includes several statements of use in structured programming and has the facility to execute Assembly language subroutine calls. This means one can combine Basic with Assembler to speed up execution of frequently-used portions of the pro-

This is the 17th in a series of articles giving the highlights of benchmark tests conducted on popular small computer systems. The full reports were originally published by the Association of Computer Users, a 4,000-member nonprofit organization.

Disassembler is offered as well, something we have not seen before on a system benchmark tested. With the Disassembler, machine code can be returned to its assembler source form — a reversal of process which comes in handy when the user wishes to modify software for which no source code is available.

Hobbyist Appeal

This arcane procedure has great appeal to hobbyists and others involved in swapping software which never did get proper documentation, or which was supplied in object-code form originally.

gram. In addition, Basic-80 offers direct execution of statements. Any statement entered without a line number will be executed immediately in conversational fashion.

The program editor supplied with the System B was not as efficient as some we have tested in terms of number of keystrokes required, but the commands were not difficult to learn and use.

Like most Basic editors, it is line-oriented. The user types the line number he wishes displayed, and various commands may be used to move the cursor, insert, delete and so on. No global search-and-replace capability is

provided.

In checking with customers, the independent consulting firm which performed the benchmark testing found that most systems were being used in a word processing application. Some incorporated the Vector Graphic Memory word processing system, while others had Word Star, Electric Pencil or other standard WP packages. Vector Graphic also supplies a Data Management System besides the WP software. This is the extent of its involvement in customer applications.

Software Packages

Dealers supply a variety of software packages, including the Peachtree Accounting Packages, a group of five modules ranging in price from \$800 to \$1,000 each.

Few of the customers contacted during the survey were doing their own programming. Most had purchased a turnkey system which was provided along with training, documentation and support. The "personalization" which the System B requires during the setup process was also performed by the dealer.

Factors such as the amount of memory installed, type of printer and so on must be made known to the operating system. Clear documentation is provided to guide the user who wishes to do this himself, but the process does require some technical background.

While there were a few complaints about the suitability of applications software, most customers were very enthusiastic about the System B itself. Despite its low price, some felt it was built better than comparable systems, and one remarked, "The Vector Graphic is the most reliable machine on the market." Low cost and efficient software and repair services were key factors guiding their choice of system.

Next week: the Digital Equipment Corp. Decstation 78.

About the Author

Hillel Segal is president of the Association of Computer Users (ACU), a nonprofit association with members all over the U.S., Canada and several other foreign countries.

One of the association's key activities is the publication of its "Benchmark Reports." Each month a new report is produced covering another computer system.

In addition, ACU publishes seven bimonthly newsletters for users of small computers, mid-size computers, large computers, time-sharing systems, distributed processing systems, word processing systems and home and hobbyist computers.

A complete set of sample copies of each of ACU's newsletters and complete information about membership in ACU is available from the ACU at P.O. Box 9003, Boulder, Colo. 80301.

Can Human Interface Be Packaged?

Q I am doing strategic system planning for a multinational corporation offering financial services. The theme underlying my plans is one of integration. The system will incorporate a central data base, process automation, process tracking and control, word processing and electronic mail. For medium-range time frame, a nationwide network of distributed minis is planned.

Another theme central to the plan is that the system be "user-friendly." For this reason, I feel rather strongly that the system present a uniform appearance to its user. That is, the user should see and use standard command formats, menus, error messages, screen formats, "Help" messages and so on, regardless of whether they are doing data inquiry or word processing.

The problem is this: I would like to purchase at least part of the software required, but how do I get a uniform human interface? What I need is an OEM software house which provides word processing, electronic mail, and so on that are transaction-driven. Then I can package the human interface myself. Is there such an animal?

A Although your intentions are good, it may be impractical to consolidate so many diverse applications. Although hundreds of software houses provide at least part of the systems and applications software support that you require, I know of no single source.

I would be happy to forward responses from software houses who feel they can meet your requirements.

Q In your reply to the question of graduate degrees [CW, June 30], you stated (correctly, I believe) that, "No one degree is best for programming." Then you devoted most of the rest of your reply to computer science and information systems degrees. Even the M.B.S. is a Master of Business Science.

One of the biggest problems we face is communicating with users who do not talk in bits, bytes and nanoseconds. These users talk in terms of debits, credits, inventory turns, expense analysis, budget variance and the like. Let's face it, a company can only stay in business if it makes money. Therefore, financial control is very important.

I'm not slighting the other areas of order processing, inventory control, engineering, distribution and service. The point is that the degree should be in business because it gives a good introduction to the broad scope of business management and is particularly useful to the person who has a non-business undergraduate degree. It introduces business terminology and concepts which are invaluable in dealing with a variety of users. The specific detail needed for solving a problem will be supplied by the user.

I recall a situation where a programmer analyst who knew very little about accounting attempted to solve a problem in the area of general ledger. The

accountants knew what they wanted but their proposed solution was a disaster from a DP viewpoint. When the situation was reviewed at the request of the programmer analyst, we worked out a different approach which gave the accountants what they needed, but at the same time it reduced the programming effort required by eight weeks. Just knowing the accounting concepts helped a great deal in this case.

As for the reader's comment that his peers are "pecking away" at getting their master's degrees, Confucius said it best, "Even a journey of 1,000 miles starts with the first step." Get going, friend. I speak from experience, having received both my bachelor's and master's degree at night.

A Thank you for this opportunity to set the record straight. The M.B.S. was a typographical error and should have been the master's of business administration (M.B.A.). I am a strong advocate of DPers understanding not only the basics, but the intricacies of the functional areas in which they work.

Whether a programmer seeks an advanced degree in computer science, information systems or business is dependent on his background.

Programmers should strive to obtain knowledge (or a degree) that provides the mix necessary to enable them to effectively communicate with users and to accomplish their job function.

Turnaround Time
By Larry E. Long

QA

Have a question? Send it to Larry Long, Editorial Department, Computerworld 375 Cochituate Road, Rt. 30, Framingham, Mass. 01701.

Long is a professor at Lehigh University, a DP consultant and author.

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EDITORIAL

High Expectations

According to users who responded to a survey by Datapro Research Corp., Amdahl Corp. mainframe users like their systems better than users of any other equipment. Likewise, more Amdahl users than any other would recommend their systems to other users [CW, May 19].

Another source — this time researchers on IBM's payroll — hold Amdahl systems superior to IBM systems on a price-/performance basis, according to internal IBM documents introduced this spring in the U.S. vs. IBM antitrust trial [CW, July 14].

Gene M. Amdahl, founder of Amdahl Corp., who retired from the post of chairman and chief executive officer last September, is the man behind those systems. Amdahl came from IBM, where he is credited with developing the architecture for the IBM 360 series of systems. He's no upstart in the business.

Thus it is with unbridled enthusiasm that *Computerworld* greets the news that Gene Amdahl is forming a new company to develop a system to compete head-on with IBM's intended H series.

IBM plug-compatible mainframes have been a boon to users, helping them save money without sacrificing efficiency, service or their library of IBM programs.

Amdahl, whose new company has yet to be named, expects to have his product ready for the marketplace by 1984, three years after the H series is expected to debut.

Given his past record, it may be something worth waiting for.



'How did IBM take my switch to the other outfit? Well, no worse than expected . . .'

LETTERS

On Behalf of Contractors

The Independent Computer Consultants Association (ICCA) wishes to respond to "More Harm Than Help? Managers Warned of Contract Programmers" [CW, Aug. 18]. ICCA is a national, not-for-profit, professional organization dedicated to "increasing professionalism in the industry."

Many of our members are independent contract programmers. Their livelihood is based on successfully providing services to client companies. We recognize that not all consultants or contract service organizations provide professionally competent services. That is one reason ICCA was formed in 1976.

We have established a code of ethics, are working on a code of professional conduct and have established a "Better Business Bureau" approach to enforcement. Each member agrees to abide by our codes. Complaints by clients are investigated and membership may be revoked for noncompliance. (Because of legal problems, ICCA cannot intervene when nonmembers are involved.) By policing ourselves, we can offer the business community the greatest potential for successful consulting engagements.

ICCA agrees that management information services (MIS) managers should exercise caution in contracting with any outside service. Always check references. It is easier than checking past employment history and probably more accurate.

Independent consulting is not a safe place for the incompetent. They are better off with full-time jobs. To be successful in this business, one must be a self-starter, technically competent, able to get along with people and, most importantly, must be able to deliver results.

Some of the poorest results come from dealing with what are referred to as "body shops." These organizations hire part- and full-time programmers off the street to fulfill time and material contracts. They take little or no responsibility for the work being done.

A contract programmer or small consulting firm is different. They take project responsibility. The principals of the organization must deliver to

contract specifications to be paid. Employees in this kind of firm often earn bonuses for jobs well done. There is a real sense of loyalty and responsibility.

Steven A. Epner
President

ICCA
St. Louis, Mo.

Effects of Structure

Under most circumstances, I would have dismissed Philip Kraft's article "Programmers Seen Needing Fewer Skills" [CW, July 28] and the follow-up editorial "Software Workers of the '80s" [CW, Aug. 4] as two more entries in a rather boring lineage of articles predicting the demise of the programmer. What struck me was Kraft's bold assertion that structured programming and related techniques are the vehicle by which this change will come about.

Although I personally endorse structured methodologies, I am not aware of one controlled experiment showing that such methodologies affect programmer productivity, the quality of software or the evolvability of systems. A controlled experiment would have the following characteristics:

- It would involve the implementation of a real system.
- There would be two development teams, with members chosen on a matched-pair basis.
- All controllable factors would be identical (e.g., budget, schedule, management).
- It would be a double-blind experiment, with one team using the proposed technique and the other using a competitive technique.
- The experiment would preferably be run multiple times.

It's not surprising that people aren't running out to try these experiments. Who is willing to pay n times as much developing a system to test a technique they're convinced is worthwhile?

I don't believe that any methodology can ever replace a software engineer. However, if we are going to promulgate techniques that inject some science into the art of computer programming, we had better do it scientifically.

Paul C. Anagnostopoulos
Maynard, Mass.

DATA PAST

Eight Years Ago
Sept. 13, 1972

HARRISBURG, Pa. — In the wake of tremendous flood damage caused by tropical storm Agnes, the State of Pennsylvania considered issuing regulations requiring state DP centers to be located in flood-safe locations.

A task force was gathering data from flood-damaged centers.

KENSINGTON, Md. — Position titles in the computer field were in a "state of chaos," according to a report submitted to the Association of Computer Programmers and Analysts (Acpa). This was why programmers and analysts were being denied professional status, the report said.

Five Years Ago
Sept. 10, 1975

SPRINGFIELD, Va. — The Honeywell, Inc. 6180 CPU was better able to provide a secure operating system than the Digital Equipment Corp. KI-10, IBM 370, Xerox Corp. Sigma 9 or Burroughs Corp. B6700, according to a report prepared for the U.S. Air Force by Mitre Corp.

The DEC KI-10 rated close to the Honeywell machine in being amenable to the user implementing a secure system, the report said.

The 370 and Sigma 9, however, were both found to be "very difficult to use as bases for a secure system," and the B6700 would be an "extremely difficult" CPU around which to build a secure computing system, the report said.

READER COMMENTARY/James A. Eastman

Some Project Leaders Suffer 'Fear of Flying'

When a system is about to be implemented, but things are not going smoothly, sometimes the project leader is the person causing the problems.

The reasons for this phenomenon are many and will be examined in some detail. However, they all relate to the fact that the project leader is afraid to implement his project — or, to use the catch phrase, he has a fear of flying.

This fear of flying may be obvious. The project leader may plead with his supervisor to be assigned to another project or tell the users that he wants to get off this project.

The project leader might even know the cause of his fear of having the project fly. For instance, he might feel that the proposed system will never satisfy the user or that the user still doesn't know what he wants.

On the other hand, this fear of flying might be well concealed, even to the point that the project leader with the fear will not admit it to himself.

There are a number of reasons a project leader might want to kill his project. Among them are:

- Fear of the user. In this case, the project leader feels the completed system will not meet the user's needs, either because the user wants the system to have a greater capability or because the user knows only what he doesn't want. In either case, the problem has been allowed to grow because the project leader and the user failed to communicate effectively. In many cases, the project leader probably found it easier to promise the world than to help the user develop realistic objectives.
- Fear that the project development steps to date were done in a sloppy manner. Every DP organization has procedures that supposedly ensure a good system, or at least that is what management wants everyone to believe. The development steps usually involve a sign-off after such stages as

the conceptual design. The project leader might feel as the project is about to be implemented that certain things should have been considered at a certain point, and since they weren't, that the project is doomed.

• Fear of having his work carefully examined. It might be that there is a formal review process of a completed project that can be embarrassing for a project leader. Even when there is no formal review process, it is obvious when there is a serious system failure.

• Fear of success. This is not the usual fear, but it is very real. If the project is a success, there can be a real fear that the project leader will be tied to it for a long time, while others get to work on more exciting projects.

Although a project leader might not know or be willing to admit that he is afraid of having his project implemented, the techniques he uses to kill his project are usually very deliberate and easy to identify and can be quite

ingenious in the process. Among the methods to kill a project are:

- Try to get the user to back down. This can be done by putting increased demands on him. For instance, the project manager will consult the user on every detail, often many times. Also, the project leader can make the proposed project appear to be impossible to maintain.
- Try to find another project that desperately needs the project leader.
- Look for changes in the user side. In this situation, the project leader looks for personnel changes and then quickly exploits the change, saying either that there is no longer user support or that the new user must be "educated" and that this will take time. Either way, the implementation date has been delayed.
- Decide that the system should be more "advanced." An example of this would be to suddenly insist that the system have on-line updating, when it had originally been decided that batch updating was sufficient.
- Find another job, or at least drop hints that the market looks good. This is obvious and in DP shops, only too familiar!

Clearly, many of the reasons a project leader might want to kill his project can be traced back to the project leader himself. Often he has difficulty communicating or is really in over his

(Continued on Page 44)

READER COMMENTARY/Peter Bodman

Making Contract Programmers 'Fit'

I read with great interest the recent article concerning contract programmers, "More Harm Than Help" [CW, Aug. 18]. While the piece was generally informative (though it may not have deserved such banner headlines), I believe there should have been a far greater degree of depth and counterpoint provided to readers.

By and large, "contracting" falls into four general categories:

- The first is "free-lance," whereby the contract programmer works in a totally independent manner, having no association with any type of programming service company, directly charging his clients for services.
- The next category is the "subcontractor," who is affiliated with a contract programming (or similar) company; although this relationship doesn't include the actual employment of the subcontractor, there is usually a legal agreement, or contract, in effect between the two entities for the duration of assignments.
- This agreement, besides defining amounts to be paid for services and specifying work to be done, includes provisions for professional and ethical expectations by all parties concerned. Depending on circumstances, subcontractors are paid on an hourly T&M and/or fixed-price basis by the contract service company.
- The third category is what I call the "quasi" contractor, who is actually a captive employee of a programming/software service firm. As such, this individual, being a true employee, often receives benefits generally parallel with staff personnel of other companies.

- The last general category of contractor is the "consultant" whose overall knowledge, technical ability and analytical experience allow him to problem-define and/or solve dilemmas of DP installations. Typically, the consultant is a free-lancer, often because of the high rates for his services, though he can have a relationship with

any of the above categories.

Readers of the article may have assumed, erroneously, that all contractors are of the first type and, from the flavor of your article, each is out to rip off users and is an "occupational misfit."

Not All Misfits

While I think that some programmers who have difficulty in maintaining positions of captive employment turn to the contract industry, not all of these people are, stereotypically, misfits. Let's face it: There are occupational misfits in any industry. Yet, through a comprehensive preassignment evaluation by the user (keeping in mind the technical requirements of the work to be done and the personality profile required to do it), DP management can often weed out potential misfits or incompetents before any damage is done.

Jumping around from job to job is really the name of the game for contract programmers, just as it is for mercenaries who are hired to fight wars for countries or ideologies other than their own; and, because the contract programming industry is so highly based on reputation, contractors seldom remain active in it (for long) unless they're really good at what they do. Whether one talks about "loyalty" in a captive employee or the "pride" of a contractor, both nebulous terms at best, it is *all* who benefit if the assigned work is done correctly and on schedule.

In short, contractors go where the work is, where it's the best obtainable and where the pay is greatest — as most of us usually do anyway.

Avoiding Resentment

The statement that "contractors stir up staff resentments and even contribute to personnel turnover by bragging aloud about their salaries" is, I feel, a generalized potshot. While there are those "uneducated" contract program-

mers who do make such errors, captive employees have made the same errors with the same results. However, with careful instruction to the contractor,

(Continued on Page 46)

THE TAYLOR REPORT/Alan Taylor

DPMA Practices Show Lack of Sophistication

The Data Processing Management Association (DPMA) recently put on a recruiting campaign and, in doing so, committed a mixture of errors that seem to be endemic to that organization.

One of the recipients of a recruiting letter was R. Peter Ericson, director of data processing at the Institute of Living in Hartford, Conn. He replied to DPMA Executive Director Edward Palmer, pointing out the following:

(a) He had quit DPMA because he felt that "a professional data processing organization ought to set a positive example in its use of computers," and that, at the time, DPMA had not been setting such an example.

(b) The salutation in the recruiting letter, "Dear Peter D," did not demonstrate the sophistication that would be expected from a leading DP professional group.

He was right, of course. Where "Peter D" came from I don't know. There is no "d" in Ericson's name, so that is out. However, there are two "d's" in his title — "director" and "data." I suspect that one of these words was abbreviated, truncated and then used in a name field instead of a title or name-and-title field.

But regardless of the cause, one-letter last names just are not correct here, and a sophisticated user would have noticed this and stopped sending out the standard mailing until the real name was found.

Ericson did not let matters lie there. He wrote to Palmer, giving his reasons for having dropped out (the association's lack of leadership) and for believing that the flaw was still present (Peter D). Shortly thereafter, he got another form letter from Palmer, apologizing for duplicate mailing and mailing to members. But the letter did not respond to Ericson's comments at all!

At this point, Ericson must have felt justified in his criticism of the DPMA for lack of sophistication. But the crowning glory was still to come. Along came a follow-up, with a handwritten note from Palmer: "If your reply isn't already in the mail . . .!"

Then Ericson, with clear proof that replies sent to Palmer were not even read before replies were sent, blew up and sent the stack of letters to me.

The computer handling of DPMA has always looked somewhat below standard. And doubtless this lack of leadership is a major flaw to

(Continued on Page 34)

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READER COMMENTARY/Peter Lacey

Structured Coding's Twin Myths

It would seem to be about time that someone commented on the twin myths of structured programming: (1) that it is successful because it avoids GOTOS, and (2) GOTOS make a program less easy to understand. In actual fact, GOTOS have little, if anything, to do with it.

Let us consider the second myth. It is claimed that GOTOS obscure the logical flow of the program by jumping in or out of sequence. While this is certainly true of poorly planned programs, in which a programmer had to incorporate oversights or corrections as he went along, it does not apply in general. Every program consists of three phases: initialization, processing and termination. The processing phase always involves at least one loop and usually can be broken down into several sub- "programs" which involve the same three phases. This loop is represented by a starting point, an ending point and a transfer of control back to the starting point.

The clearest way of indicating this is with a GOTO: it can be done with a PERFORM, of course, but since this uses two implicit rather than one explicit GOTO and places the details of the processing (which usually would involve further PERFORMs) at a different level in the program, it cannot be stated that it is easier to understand.

Examples on these pages in the past have demonstrated what laborious circumlocutions are necessary to avoid a simple GOTO: nested IFs (which

should be avoided like the plague in any programming method), numerous artificial switches and nested PERFORMs ad infinitum. This sort of coding can become routine and natural, as can nearly anything, but in no cases but the very simplest will it produce a control structure as simple, direct and obviously mirroring the program flow as does a properly planned program using GOTOS.

Therein lies the rub, of course: proper planning. No programming method will produce quality programs if proper planning is ignored: any method will do so if it is, including structured programming. Elimination of GOTOS is not a program planning device, but it is an unavoidable method of forcing the programmer to do some planning before he sets pencil to paper.

Structured programming is a subset of structured design, which consists of carefully worked-out methods of designing systems and their component programs as thoroughly and methodically as reasonably possible, with as much emphasis given to review as to design. Such an approach will, in ev-

ery case that it is properly used, result in better programs (better by whatever criterion one wishes to apply).

Any complete and consistent planning method will produce similar results (I remember reading in *Datamation*, many years ago, about a 10,000-line Fortran program, planned with decision tables, which ran correctly on its first test) regardless of coding rules or language.

This brings us to myth No. 1. The successes of structured methods have come about precisely because of the emphasis on planning and review, not because of coding rules such as "no GOTOS." Let those who would dispute this give it an honest try: subject some system to a full-blown structured design and then program it using GOTOS. The results will be as good as before.

That there should be such a debate over inoffensive GOTOS indicates rather alarmingly how little understood or practiced is the planning function in this industry.

Lacey is an MIS manager with Co-Op Implements Ltd. in Winnipeg, Manitoba.



DPMA Methods Old-Fashioned

(Continued from Page 33)
many. Sometimes it seems DPMA goes out of its way to demonstrate that it is old-fashioned.

Two examples spring immediately to mind — one very recent and one now some years old. In preparing for an Aug. 27 hearing on sales taxes, DPMA quoted a 1977 situation in which New York ended up exempting data processing and "decided not to apply old regulatory concepts to a whole new state of art, a new business." The association then urged Massachusetts to do the opposite by using a precedent set in 1936!

Similarly, in the long, drawn-out controversy over the DPMA "Man" of the Year award, one cannot help thinking that even when it was first set up — and presented that first time to Grace Hopper! — there was almost a death wish in labeling the award with a question-begging title. A different name, a different first recipient or a swift change of name would have made the association appear better prepared for the future.

But as it is, the public appreciation is of an association that reads neither the handwriting on the wall nor the letters that people like Ericson write. And that shortcoming, rather than minor incompetence, is why many don't join.

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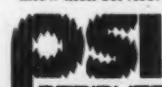
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Peter P. Blozis (right) is Wilson's Vice President, Information Services Division. Lea Edmunds is Technical Services Manager.

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READER COMMENTARY/Girish Parikh

Software Maintenance Methods Need Refining

The In Depth article "Maintenance Programming" [CW, July 28], by David M. Clark, is one of the gems in the rare but urgently needed literature on how to do maintenance. I offer the following thoughts based on my study and experience.

While other aspects of software maintenance, such as documentation, software tools in maintenance, maintenance management techniques, maintenance reviews, structured retrofit and structured maintenance aid in the maintenance process, the actual maintenance work (also known as direct maintenance, or solving the immediate problems) is the heart of software maintenance.

Techniques of direct maintenance include the technical as well as the managerial areas. Direct maintenance programming addresses the technical problems and includes techniques to

solve them.

Other techniques of software maintenance that are implemented and the nature of software to be maintained (that is, structured, semistructured or unstructured; if structured, the methodologies used to develop it) affect the techniques of maintenance programming. To an extent, some of the maintenance programming techniques can be generalized and from this generalized store of knowledge, techniques can be adapted or specific techniques developed for a particular problem.

The generalization of the techniques may begin from the study of the specific maintenance problems and techniques and may transpire over a period of time.

A changed program may or may not work or may even be worse than the original program, depending on the quality of the original software, the

magnitude of changes and problems and the competence of maintenance programming.

'Black Box'

What goes on in the black box of maintenance programming? Well, that is the mystery to be unraveled. The techniques of maintenance programming, collected from the often-guarded secrets of a few, can be refined or developed further and made public. Thus, maintenance programming methodologies can be developed.

Maintenance programming, practiced widely, but not yet a formal discipline, is a wide subject like development programming. Some techniques may overlap, however. Maintenance programming should have its own body of knowledge — a collection of tips, techniques, guidelines, standards and sources. I emphasized this point in "Maintenance" [In Depth, CW, Dec. 10, 1979]: "The need for collecting and developing techniques to handle such unstructured software is even greater than that of structured software."

Clark referred to "a formal methodology in how to make changes to an existing program." The methodology, in my opinion, is concerned with much more than merely changing a program. Preserving the integrity of a program is equally important, so that the maintainability remains at the prior level or is even improved upon. The dual-purpose, direct maintenance programming of unstructured programs should primarily aim at successfully changing the program and secondarily improving the maintainability, whenever possible.

The major structured methodologies should incorporate maintenance techniques appropriate for each method, for providing guidelines in making changes, as well as for preserving the structural integrity during that pro-

cess. Jean-Dominique Warnier of CII Honeywell-Bull, France, has done notable work by providing guidelines in his book, *Program Modification*, for modifying programs developed according to the Logical Construction of Programs (LCP) method. I believe Jackson methodology also provides some guidelines for changing programs developed using that method. To my knowledge, such work has not yet been done for other methodologies.

How Much Help?

The next point I would like to address is how much help should be provided in determining how a programmer should go about making a change.

Some programmers are good in investigative (like investigative reporting?) aspects of maintenance programming. They incessantly dig into the listings and other sources and point out where changes should be made. Then they lose interest or are not good in further work. A lot of work still remains: making the changes, compiling, creating proper data if not available, testing, verifying the results, updating documentation, saving the old program and installing the changed program. In the future, specializations in maintenance programming may emerge. Such routine tasks can be described in a maintenance programming standards and guidelines manual.

After an expert determines where to make changes, the rest of the tasks can be done by a junior programmer or a maintenance programmer technician under the direction of a responsible senior programmer. The expert may, meanwhile, divide his time to solve other problems. This method should prove to be more cost effective.

The systems analyst should generally be able to define the system problem, or otherwise he would not be able to help the programmer. For instance, in a major Midwest company for which I worked, an analyst gave me an assignment which said, in essence, "Find the problem and solve it!"

Finally, the maintenance programmer, while attacking the direct maintenance problems should also look forward, keep notes and develop maintenance strategies to enhance and improve the life cycle of the system. He should take time to plan ahead (management should encourage this).

Having insights into the program, he is in a unique position to outline the strategies. Also, after looking at what has been done, he can usually establish a pattern and draw inferences. Management should provide training in these areas and reward the efforts of a maintenance programmer.

With the advent of maintenance programming methodologies, a discipline of software maintenance engineering will emerge.

Readers are invited to comment on the techniques they have developed to cope with the maintenance problem, by writing to Parikh at Shetal Enterprises, 1787B W. Touhy, Chicago, Ill. 60626.

Parikh is a consultant specializing in software maintenance and structured methodologies.

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READER COMMENTARY / Paula Bell

Technical Writers Must Aim for Clarity

I have been a technical writer for two years, long enough for me to wince at less-than-complimentary remarks concerning user documentation.

Critics are not limited by specialty or by level of experience. The user may be an experienced systems analyst or design engineer, a field engineer who has been cross-trained and is not practicing his initial specialty or a novice computer operator who is filling in for the regular operator who is recovering from a skiing accident, for example.

I must risk agreeing with the critics or sounding like the ex-English instructor that I am. My point is that writers in the DP fields must take the responsibility for improving technical documentation.

I mean both hardware and software writers, writers with technical knowledge who may not remember much of what was presented in their last English class — or in what year — and writers with composition skills who are still memorizing acronyms and trying to believe that you really can multiply in binary.

Two Advantages

Technical writing offers two exciting advantages: Valuable access to information, enough to keep up with technological advances in the most advanced of all technologies and invaluable opportunity to practice discipline in the craft of writing.

Communication media and their support industries are proliferating. We are all bombarded with anomalous, useless, and ambiguous data passing as information. An example of each follows and may produce a wry grin in addition to the frustration.

A newsreader, reporting an accident, informed his audience that four of seven people involved were "ambulatory." The other three were able to walk away from the accident.

Or maybe you read about the consensus of the vulcanologists in authority after Mount St. Helens' first spectacular newsworthiness: "We don't know what will happen, but whatever it is, we expect it."

Everyone has come across

governmentese like, "No child shall be employed on any weekday when the school is not open for a longer period than four hours."

I have the dread feeling that somewhere among my own published paragraphs I may have committed an equal folly; I only hope my readers enjoy it as much.

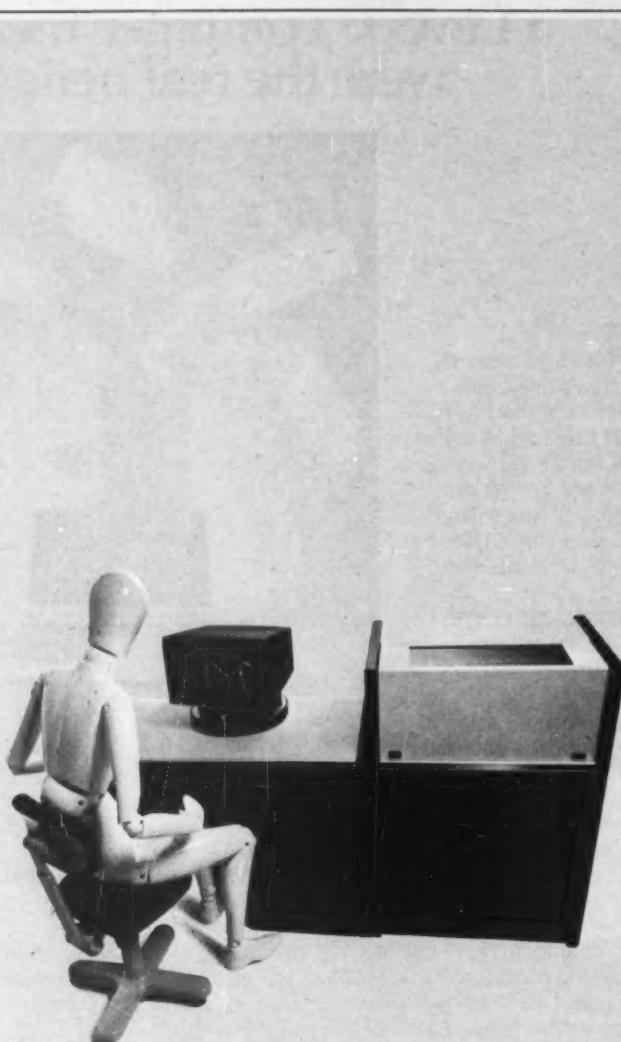
We can lessen the amount of worthless information (if such a paradox can exist) and refine the medium by which the message will be carried by writing with precision.

The technical experts — programmers, engineers and designers — are responsible for reading a proposed manual in order to correct technical errors involving contradiction or inadequate information.

Technical experts should not be required, or encouraged, to do a rhetorical edit. Experts are busy too, as they may state, and many do not consider documentation review an essential objective in their pursuit of the leading edge of the state of the art.

If an explanation or a procedure is unclear or incomplete, the expert, already understanding the material and not having to read for information, may not notice the confusion. The writer cannot compensate for these omissions. However, the writer must be the expert in all other

(Continued on Page 42)



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On Management

I read with pleasure Howard A. Karten's response to my commentary [CW, July 14]. He wrote well and addressed himself to the issues. As with any important aspect of management and technology, there are legitimate areas of disagreement. However, there are some points I wish to clarify.

Karten made reference to the "... job knowledge required by users." I was writing strictly about job knowledge required by programmers. I agree wholeheartedly with

him that users should be buffered from changes in technology.

Also, the example he presented of the futility of "trying to achieve a fancy overlay structure that uses 10K fewer bytes when the cost of the programmer's time is greater than the gain in efficiency" actually proves my point.

It is technical management which must maintain an envi-

LETTERS

ronment of awareness and pride in keeping up with changes in technology — and cost is a factor of technology — which would discourage the technical staff from such anachronisms. As recently as 1979, I heard about a manager who advocated two letter variable names because "the resultant programs take less time to compile!"

I also agree with Karten that

"a manager is supposed to manage work, not do it himself." But part of managing is understanding. The General Electric Co., one of the major proponents of generalized management, still has engineers managing its engineering sections for that very reason.

I want it clearly understood that I am only addressing technologically intensive ac-

tivities, such as program development and engineering.

I also agree with Karten that selecting, training, motivating and retaining people has become tougher in the past decade. That, in fact, is the central point to my commentary.

How do you select one programmer over another if you don't appreciate the importance of structured walkthroughs?

How do you train employees if you don't know what training they need?

How do you motivate a programmer to take pride in his work if you tell him to save 10K bytes with a fancy overlay structure?

Finally, how do you retain employees when they don't respect your understanding of the technology they must employ?

Floyd McWilliams
Stanley, N.Y.

Everyone's Paying

How often do we read or hear something and not see or listen to the intended message?

John Stewart's statement in his letter [CW, July 14] that there was "no loss of relevant material" in my data theft case was unwarranted.

Regarding the \$2,000 in charges made on four different account numbers within one week, the thief did get a TV valued at \$633. We are all paying for this, along with all other thefts of merchandise.

If you do not believe this, ask any police fraud squad and/or your casualty underwriter.

The message is, tighten up credit practices to ensure privacy and accuracy.

Recent events since the publication of my story have pinpointed the access to our, and possibly other, TRW Credit Data profiles by another organization not previously mentioned.

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HUMAN CONNECTION/Jack Stone

Programs Help States Target Emergency Aid

What do state governors do in the event of sudden and large-scale riots in their cities? Or erupting volcanoes in their countrysides? Or sinking oil tankers near their shores?

Most citizens know that the governor responds with emergency assistance for casualties, acts to reduce the probability of secondary damage, provides special forces to maintain security and speeds recovery operations.

But during recent years, the number and diversity of man-made disasters have dramatically increased. Governors have found it difficult to handle them as effectively as necessary because of a limited supply of trained

personnel and special equipment.

Furthermore, although there are many federal government programs that provide emergency assistance, each has its own mandate and restrictions, which makes coordination difficult in times of crisis.

In 1977, the National Governor's Association (NGA) urged Congress to consider the consolidation of these efforts. The end result was the formation in 1979 of the Federal Emergency Management Agency (Fema), whose job is to set national policy and operate the major disaster assistance programs.

NGA also organized the Emergency Preparedness Project, under the direc-

tion of Hilary Whittaker, to examine the state's problems in managing all types of emergencies. Here is a summary of a recent interview I had with Hilary and her two associates, Vern Wingert and Jaynelle Ketchum.

What were the findings of the project?

HW: We identified several important areas of concern. First, working with Fema, each state has the capability to coordinate its responses to presidentially declared disasters, which number perhaps 40 to 50 per year across the entire nation. But very few states have the resources to handle their share of the 30,000 to 40,000 lesser disasters

that occur each year, such as those involved with technological hazards, energy and materials shortages, droughts or civil disturbances.

Second, emergency operations appear to be fragmented at both the federal and state levels, by emergency type, phases of management and organizational involvement.

What do you mean by "phases of management"?

HW: We describe emergency assistance in terms of Comprehensive Emergency Management (CEM), a four-phase management process. The first is mitigation, long-term actions intended to eliminate or reduce the possibility of a disaster, such as legislation to control the storage of nuclear waste.

Second is the preparedness phase in which plans are drawn up to save lives and minimize the effects of those disasters that cannot be avoided. Third is response, which is generally understood, and the fourth is recovery, during which short- and long-term projects are implemented to return life to normal conditions or, better yet, to a less disaster-prone level.

What is happening with regard to improving CEM operations?

VW: Fundamental to the proper management of emergency assistance, just as in any other government activity, is the acquisition of data that can quickly help identify program resources. We have recommended a long-term program of computerization to accomplish this goal. As a matter of fact, we have just recently implemented our first computer application and are delighted with the results so far.

Could you describe it?

JK: Surely. First, some background. By our count, there are currently 315 federal programs which provide 26 different types of emergency assistance to the states in 30 subject-matter categories. Each subject category is, in turn, organized into dozens of subcategories.

VW: And each of these programs has its own set of requirements by which a state government or other applicant may qualify for assistance. The governors complained that it was very difficult to determine, in time of emergency, just which federal programs could be utilized.

HW: First, we researched these federal programs and summarized their key provisions in an easy-to-read catalog. Then Jaynelle developed a keyword index to the federal assistance programs, and we arranged for software to be developed to convert the index into a computerized data base. We named the application National Emergency Assistance Programs (Neap).

We chose Neap as the first application because it served an immediate need. Also, it required relatively few resources to implement. Fema agreed and supplied the funding for the effort.

Its value has already been demonstrated: working with Neap, we were able to help governors quickly identify relevant federal assistance programs in the Mount St. Helens eruption, the Miami riots and other recent emergencies.

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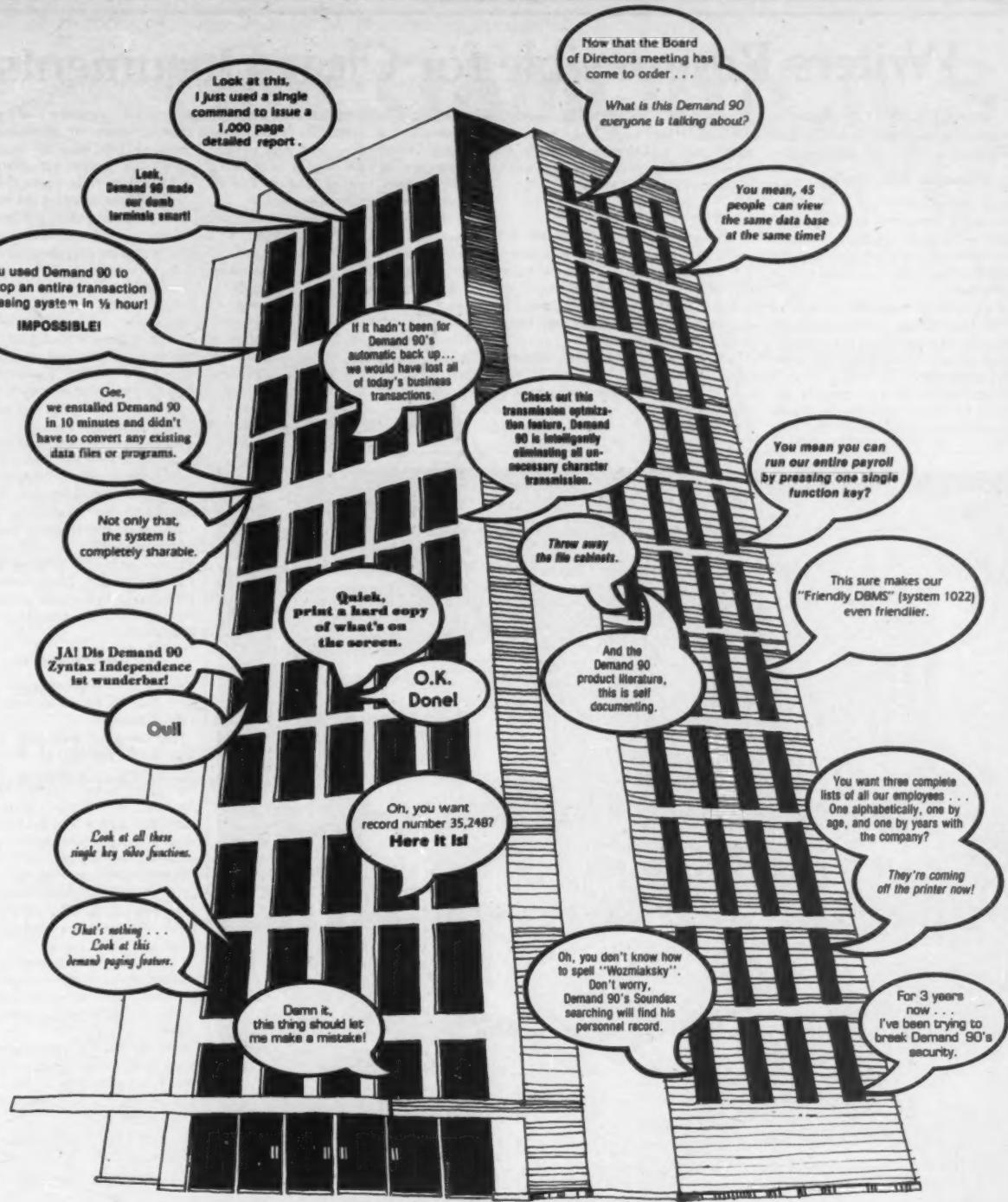
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Writers Responsible for Clear Documents

(Continued from Page 38)
aspects of composition, including dictation, grammar, structure and format.

Rhetorical Skills Needed

The technical writer needs the rhetorical skills important to creation of all good writing, the organization skills particular to technical writing and the terminology peculiar to writing in a specific field.

The writer must have adequate technical understanding to write about diverse subjects concerning the assigned manual, its specific purpose and its intended audience.

The subject must be thoroughly researched by interviews with the developers and through document research.

The resulting information must be evaluated for exclusion, inclusion, elaboration and then arranged in the proper form for presentation. Now the writer can sit down to write.

On-the-Job-Education

Continual technical education is a part of the job, as it is for everyone in DP. Writing skills are often acquired on the job during the writing of the manual (on the run) or independently (between assignment crunches). We all need to keep learning.

To writers who have come to technology from writing: what does 2²31-1 really mean in the grand schematic of things? To writers who have come to writing from technology: There are

fewer rules for grammar than there are mnemonics in assembler language or logical alternatives in chip design. There are far fewer rules to learning how written English works than to learning how a computer works.

Following the basic prescriptions in one good grammar and rhetoric text can help any writer compose more useful manuals. Reviewing Strunk and White's *Elements of Style* once or twice a year is a great refresher and it's less than 100 pages in paperback. True, one must master some grammar jargon, but none more intimidating than technical jargon such as electromagnetic actuator or linear optimization.

Every writer knows how much easier

it is to edit someone else's work, how inconsistencies or anomalies in form, logic or reference are more quickly seen from another viewpoint. But it is not often possible, under the pressures of a deadline, to enjoy the benefits of a rhetorical edit before publication.

Some writers assume that readers will not recognize inappropriate rhetorical conventions — that users are unaware of haphazard punctuation or illogical connections.

However, many readers of technical publications are also avid readers in other fields and get annoyed at the drop of a comma. The reader is distracted from the information and the writer — maybe even the company — loses credibility.

Other readers will not recognize a grammatical slip, but also will not read prose that is more complicated than the computer operation being explained. The reader is confused, whether or not realizing that it is the writing at fault.

Good technical writing is like a friendly system. Implementations are transparent to the user and the writing does not further complicate complex subjects.

Some Suggestions

In the interests of organization, clarification and simplification, I suggest the following:

- Know your audience. Though it may not be efficient to write expressly to the temporary operator waiting for the return of the experienced operator on crutches, writing only for the latter probably means that many who most need to use the information will find it frustratingly difficult.

Maybe you can't please all of the people, but you can at least tell them who you think they are by job title, level of experience and prerequisite reading.

- Be consistent. Second person — subject understood or expressed — is generally the most concise; don't switch to third person without good cause.

• Never trust a technical term. Almost every sentence in a manual has one. The easiest way to check meaning is to ask another technical expert to define the word.

- Avoid passive voice. Its use is often an excuse for inadequate research.

• Make logical connections. "However," for example, is never synonymous with "consequently." Show cause and effect each time and only when it exists. Conjunctions are tricky and have the power to make or break a logical connection just as an OR gate will not work where the decision rests on an AND.

- Use a pronoun only when its referent is clear, especially "it." In the sentence immediately preceding, "its" is the pronoun; "pronoun" is its referent. A vague pronoun defaults to the last named noun; however, that is not always the intent.

I hope that it provides impetus for all of us who write to think about the ways in which we can make ourselves more skilled, our documentation more useful and our users more informed. Then we'll be better able to do our jobs — telling the technical experts how to keep those systems up and running.

Bell is a senior technical writer for Amdahl Corp. in Sunnyvale, Calif.



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Project Leaders Often Suffer 'Fear of Flying'

(Continued from Page 33)

head.

However, there are a few things that the project leader can do to prevent the situation from happening in the first place.

The following are some of the things that he might consider doing:

- Be thorough during all phases of development. There is nothing worse than getting near the end and feeling that

an important form was not properly designed and reviewed or that the edit specifications for a program might be next to useless.

- Keep technically abreast of developments. This prevents others, including the user, from telling the project leader how to do his work.

- Get firm (documented) commitments from the user. This prevents the user from changing the specifications

without the change being documented. Also, these documented commitments prevent the project leader from having a fear of user rejection.

- Explain the proposed system to anybody and everybody. Then no one is surprised by the final product. The process of explaining will also help the project leader gain confidence.

- Remember that almost any product is better than no

product. This is true both for the project leader's in-house advancement and for his resume.

- Remember that most projects require risk.

- Remember that no system is perfect. Even the best systems require maintenance.

- Recall past successes. In doing this the project leader should analyze the successes and see how this project can be made to be just as success-

ful.

- Don't play down the system. If he downplays the system, before he knows it, the project manager will be believing his own modesty.

One final note: Clearly the supervisor of a project leader or an "enlightened" user needs to give the project leader all of the support he needs. A successful project requires the enthusiasm and support of everyone concerned.

Eastman is director of research and statistics for the Department of Social Services, State of Missouri.

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Letters

Unkind 'Tribute'

I wish to respond to P.A. Anderson's comments regarding "ego-filled" programmers [CW, Aug. 18].

My own observations of programmers' behavior over the years and their attitudes toward themselves lead me to believe that Anderson's requirements for more ego-filled programmers has been fulfilled. Programmers in general seem to have pride in their work, but pride in one's skills and "ego-filled" are in my view two different things.

We all know some turkeys who believe they are in the business by Divine Providence.

According to them, they are the embodiment of structured perfection. Topdown excellence. Their attitude goes far beyond pride in their skills.

These people tend to embrace a view in which everyone is wrong except themselves.

This is not healthy, either psychologically or sociologically.

To imply that the likes of Edison, Einstein, Bach and Wright and any programmer who walks the face of the earth have anything of note in common is truly the unkindest tribute one could pay to those four notables.

K.M. Maadson
 Palo Alto, Calif.

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Contractors Often 'Fit'

(Continued from Page 33)

prior to beginning any work assignment, not to disclose any financial (or other) arrangements, most staff representations of this type don't need to happen.

I think many staffers are also aware that, though the contractor makes, in many cases, more money than they do, often for the same type of work, the contractor is on the job site only temporarily and doesn't share in benefits, amenities or promotional opportunities companies provide to their regular employees.

Insofar as incomplete (or nonexistent) documentation is concerned, as a criticism "directed most often" at contract programmers, I think this is an

(while the project is being completed) to ensure that instructions are being implemented as the user originally intended.

Contracting is a two-way street between the programmer and DP management; without constant dialogue, even if that dialogue consists of written and cosigned specifications, both management and contractors will spend more time and energy playing "caveat emptor" (and PMA) than turning out productive work. At the bottom line, it is the prime responsibility of the user to determine that documentation, as required, is adequate, during the assignment of any contractor; if not, the user should immediately discharge the contractor in the event

'Contracting is a two-way street between the programmer and DP management; without constant dialogue, even if that dialogue consists of written and cosigned specifications, both management and contractors will spend more time and energy playing "caveat emptor" than turning out productive work. At the bottom line, it is the prime responsibility of the user to determine that documentation, as required, is adequate during the assignment of any contractor.'

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other potshot at the professionalism and integrity of the group as a whole. Do contractors leave their clients in any more of a lurch than do captive employees who have been recruited by other companies or employment agencies?

I suspect one has to look at the nature of the beast in order to begin to answer the question. Many applications programmers, contract or captive, don't enjoy doing what they consider to be "demeaning" work such as documentation or maintenance. Yet this work must be done in order to have an effective DP installation. To alleviate the problem of undocumented work (insofar as contractors are concerned), the smart DP manager will clearly define what documentation is necessary, before the work is begun, then consistently interface with the programmer

an acceptable solution cannot be reached and mutually understood.

Any contract programmer's job qualifications and professional competence standards are, in my opinion, as easy to verify as those of any potentially captive employee — perhaps easier. To check the references of most prospective employees, the company providing the reference must generally comply with certain laws and internal policies of disclosure, often limiting the "reference check" to not much more than confirmation of employment.

When checking out a potential contractor, the user merely need ask where he has worked, what he did, when and for whom; then, it's usually a matter of simply calling that previous technical manager to verify ability, reliability and overall satisfaction. Who forgets many \$30+/hour contractors?

Often, because a contractor has "job-hopped," there's the real possibility that his background (typically, a good mix of hardware, software and applications) could be superior to that of newly hired employees. Getting the contractor up to speed, in many installations, requires only minimal orientation.

The suggestion that some, if not all, installations use only contractors (other than the exception of key senior personnel) could, in some cases, be wise, especially for the large-scale shop with many programmers, in a maintenance or fire-fighting environment.

For the shop engaged primarily in design and/or development, the role of contractors could still be as effective, especially in environments where most projects are under specific deadline and the utilization of captive employees, after completion, isn't as certain.

In summary, using contractors, whether they're free-lance, subcontract, "quasi" or consultants, can be meaningful and rewarding to most DP installations as long as management clearly understands what is needed to be accomplished, at what point and the skills required to do it.

Bodman is regional manager for Sigmatics in Los Angeles.

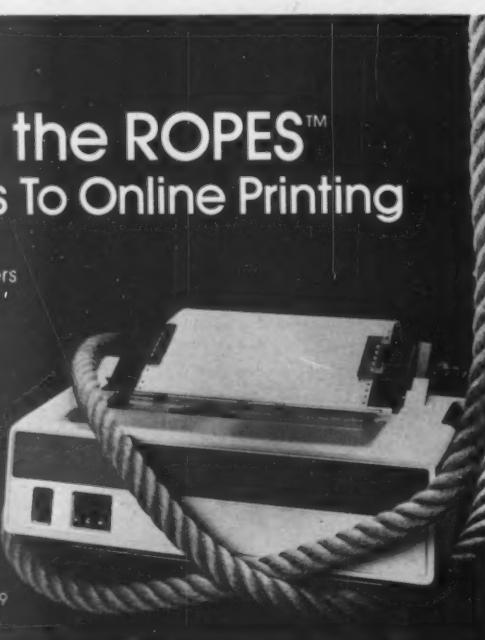
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Enhances TCSC Products

Nixdorf Launches Software Offerings

By Marcy Rosenberg

CW Staff

RICHMOND, Va. — Three months after Nixdorf Computer Corp. acquired The Computer Software Co. (TCSC) [CW, May 26], the product of that union — Nixdorf Computer Software Co. (NCSC) — has brought out its first software offerings to the IBM and compatible mainframe market.

While not new products, the announcements come in the form of updated versions

of several system software products that were part of TCSC's line before it was acquired.

Among these NCSC announcements are new releases of the Edos/V5 operating system and its associated data base management system and data dictionary; an enhanced version of the Extended Console System (Econ); and a CICS interface for the Data Entry Control System (DEX).

Edos/V5 is an operating system based on

IBM's DOS/V5 Release 34 for 360, 370, 4300 series and compatible mainframes. Features added in this latest Edos/V5 Release 1.2 include 3330-11 disk support, Isam support for 3330-11 users, priority channel scheduling for increased I/O processing speed, and cross-partition enqueue/dequeue and GETVIS for real systems.

In addition, Release 1.2 enhances IBM 370/155-I support for error recovery and provides an execution frequency monitor for all transients, phases and programs, according to Mike Youmans, NCSC product administrator.

Logical Transient Area (LTA) scheduling was also improved so that LTA is no longer served on first-in, first-out basis. Instead, programs using LTA are temporarily promoted to high-priority to eliminate contention, Youmans said.

Edos/V5 for IBM 370 and 4300 series processors can be licensed for \$8,500; a single-charge license for the 360 version costs \$13,500. NCSC also offers a VS operating system package for \$27,500 that includes 360 and 370 versions of Edos/V5, spooling, supervisor extension and 12-partition support.

NCSC Database

Available along with enhancements to this operating system is Release 7.1 of the NCSC Database, a data base management system (DBMS) that runs on Edos/V5.

(Continued on Page 48)

Data Catalogue 2 Gets Loading Aid

BEDFORD, Mass. — Users of Synergetics Corp. Data Catalogue 2 can now make use of the firm's IMS and DL/1 Convert feature to aid in loading their data dictionaries.

The feature reportedly allows users to call for automatic scans of existing control blocks or library entries of these control blocks. The function is said to read both Data Base Definitions (DBD) and Program Specification Blocks (PSB).

The function then takes the direct source entries and produces a work file and a printed audit conversion report. The report serves as an audit trail of the control blocks being processed and can also include error

(Continued on Page 48)

SOFTWARE & SERVICES

Candle Unveils CICS Monitor, Add-On Analyzer for MVS

MARINA DEL REY, Calif. — A software program that monitors CICS activity through an IBM 3270-type CRT terminal, a response time analyzer that tracks IBM CICS transaction response times and an add-on analyzer for IBM MVS systems that can be used to determine the cause of program bottlenecks have all been recently introduced by Candle Corp.

Omegamon/CICS provides information on CICS activity for operations, systems programmers and managers. On-line information is displayed in real-time through a CRT in two modes of operation. In the transaction mode, the monitor functions as a CICS transaction. In the dedicated mode, a higher level of communication is used to the CRT to provide increased availability, a spokesman claimed.

The CICS monitor reportedly provides the user with dynamic screen formatting and screen space function. More than 20 commands can be used to display information relating to CICS tasks. In addition, the system displays monitor transaction rate, Vsam and file data and internal CICS control blocks.

Degradation Analysis

Omegamon/CICS also incorporates a feature called degradation analysis that will analyze the cause of CICS slowdowns. The analysis is provided over both short-term and long-term intervals, the spokesman said.

The response time analyzer (RTA) is an optional add-on to Omegamon/CICS and displays data in real-time using the transaction or dedicated modes provided by

Omegamon/CICS. Response time data is monitored in terms of transactions or by user-defined groups of transactions. In addition, the computer's response times may be shown across two time dimensions: re-

(Continued on Page 48)

System-80 Runs On DG, DEC Gear

PITTSBURGH, Pa. — System-80, the on-line Cobol program generation system, is now available for users of Data General Corp. and Digital Equipment Corp. computers, according to its vendor, Phoenix Systems, Inc.

System-80 reportedly works off key words in a data dictionary to produce efficient Ansi '74 Cobol code to perform whatever functions are necessary in a program, according to a company spokesman.

The system is said to eliminate time-consuming manual error-and-syntax checking and redundancy inherent in any Cobol program. In addition, System-80 allows lower level programmers to do high-level programming tasks, the spokesman claimed.

The full System-80 is available to users of DG's Advanced Operating System for a one-time cost of \$19,500, to users of DG's CS Systems for \$12,675 and to Decsystems-10 users for \$29,250. Functional modules of System-80 start at \$2,500 for DG-AOS users, \$16,250 for DG-CS users and \$3,750 for Decsystems-10 users.

Phoenix can be reached through P.O. Box 7849, Pittsburgh, Pa. 15215.

(Continued on Page 48)

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Nixdorf Launches Offerings

(Continued from Page 47)

This latest DBMS release is said to allow concurrent operation of most utility functions and to use partition memory in a dynamic fashion to simplify data base program operation.

NCSC restructured the index architecture in Release 7.1 to reduce channel utilization and improve throughput rates, Youmans noted. In addition, several utility programs have been modified.

For example, the recovery utility, which manages the transaction journal file, now allows more precise specification of backup processing requirements and expanded Database trace tables for debugging and helps users bring applications back to production status more quickly, the vendor claimed.

A generalized multithread interface in Release 7.1 is said to simplify data base access through any batch inquiry system that will support a CALL feature and through such teleprocessing monitors as IBM's CICS, Westinghouse Electric Corp.'s Westi and Mathematica Products Group's MPGSwift.

A single-charge license for NCSC Database Release 7.1 costs \$30,000; a multiuser facility must be licensed separately for \$8,000. NCSC Database can only run under Edos/VS.

Datadictionary

Edos/VS is also necessary to run NCSC Datadictionary, a new version of which is now available from the firm. Called Release 2.1, this latest version includes an input creation facility that accepts record definitions from existing librarian systems to create data dictionary information.

Other features added include support for user-defined entity definitions, the ability to model new information along existing characteristics and provisions

for keeping historical records of changes as audit trails. A single-charge license costs \$12,500.

Release 2.0 of Econ was also announced. This new version, which operates under DOS and DOS/VS as well as Edos and Edos/VS, supports magnetic ink character recognition for operating systems executing in extended control mode.

It also supports the IBM 3278 Model A2 console device for the 4300 as well as the 125D CRT display unit used on 370/115 and 125 processors. These are in addition to the previously supported IBM 1052-, 3210-, 3215- and 3270-type console devices.

A new Timeout feature, when used with automatic console transfer, is said to automatically log off a terminal from Econ if no input activity has occurred within a specified time.

In addition, Release 2.0 allows users to assign single characters — A through Z, 0 through 9, #, @, and \$ — to canned messages, thus adding 39 more functions to the 36 that previously were available through programmer-defined PF and PA keys, Youmans claimed. Econ Release 2.0 can be licensed for \$5,500.

CICS Interface

Finally, NCSC announced a CICS interface for its data entry system, DEX, which formerly was a stand-alone system only. DEX-CICS runs under the CICS standard or CICS/VS telecommunications systems, the firm said.

Available for a single-charge license fee of \$6,500, DEX-CICS provides editing facilities and can perform data entry, verification, browsing, autoduplication, batch totals and check-digit generation, according to NCSC.

All software products can also be licensed for monthly charges from NCSC at 6517 Everglades Drive, Richmond, Va. 23225.

Data Catalogue 2 'Converted'

(Continued from Page 47)
messages, according to the firm.

The work file is then sorted and consolidated, resulting in a transaction file and a conversion analysis report. After checking the report, one can make direct entries into the dictionary.

An optional renaming facility enables a user to rename selected data entities.

While the Convert feature is a recent addition, the automatic generation of IMS and DL/1 control blocks from scans of the dictionary has been part of Data Catalogue 2 "for many years," according to a spokesman. Both features are part of the Data Catalogue 2 interface for DL/1 and IMS.

The DL/1 and IMS interfaces each cost \$5,000. The basic Data Catalogue

2 for IBM's OS/VS and MVS costs \$14,900 and the DOS/VS and VSE versions are \$12,900 each.

The dictionary is also available for the Univac 1100 at a cost of \$12,900. Synergetics is located at One DeAngelo Drive, Bedford, Mass. 01730.

Monitors Out For CICS, MVS

(Continued from Page 47)
cent time intervals in terms of minutes, or time slots which would involve specific times of the day.

Finally, Dexan for MVS is a degradation exception analyzer that is said to allow a performance analyst to determine the causes of system slowdowns with specific types of tasks.

The Dexan MVS analyzer costs \$5,000. The Omegamon/CICS monitor has a permanent license cost of \$12,500 that will be boosted to \$15,000 as of January 1981. However, as an added incentive, the first 25 charter customers of Omegamon/CICS will be billed \$9,500. The response time analyzer option is priced at \$5,000.

Candle Corp. is located at Suite 624, 4676 Admiralty Way, Marina Del Rey, Calif. 90291.

Corrections

The Easytrieve software from Pan-sophic Systems, Inc. now available on Univac's V5/9 operating system offers an unlimited sequential input/output option, not unlimited sequential files [CW, Aug. 11], the vendor said.

Software Education Corp.'s course, "Vsam for Cobol/Assembler Programmers," will be held Sept. 15-19, not Sept. 9-19 [CW, Aug. 18].

Cincom Updates Manufacturing Modules

CINCINNATI — Cincom Systems, Inc.'s Manufacturing Resource Planning System (MRPS) software has been enhanced in the area of its Foundation Modules, which include material control, standards maintenance and system control.

Release 2.0 is said to enable the user to maintain more control over the manufacturing environment. Specifically, it allows monitoring inventory by location, better system control for transactions and auditing procedures and expansion of the data base to include product costing, production routings and work centers, Cincom claimed.

Within the enhanced Foundation Modules is the Material Control Module, which gives the user the capability

to define multiple inventory locations, including major and minor locations such as warehouse, stockroom, bin, row and shelf. The system then monitors inventory activity against these locations, according to the firm.

Within the Standards Maintenance Module, Release 2.0 is said to expand the MRPS data base to enable the user to maintain the portion of the data base supporting production routings and work centers.

This feature is important, the vendor claimed, because: It is required for standard cost support; it is required by the new MPSS and PPCS modules; it allows current users to begin now to store data needed for activation of future modules.

Cost data is maintained for material, labor and overhead on both an accumulated cost and an incremental cost basis. This breakdown in cost is beneficial in determining the real effect of a cost increase at any level of the production process, a company spokesman said.

The System Control Module allows the user to control parameters that establish the framework of operation of the system. Global parameters, such as purge control, nervousness dampers and rate tables are controlled by the user.

The Foundation Modules are available for a one-time license fee of \$50,000. Cincom Systems, Inc. is located at 2300 Montana Ave., Cincinnati, Ohio 45211.

Synergistic Packages Run In TI Basic on TI 990 CPUs

E. THETFORD, Vt. — Several software packages for the Texas Instruments, Inc. 990 CPU series in TI Basic, each with user manuals and demonstration disks, are being offered by Synergistic Systems.

The Mail-990 mailing list program maintains up to 10,000 addresses per diskette. The Text-990 text editor provides screen-oriented text preparation functions for documents of up to 400 lines. Index-990 multikey indexed sequential-access routines provide instant access to any record in a file by up to five different keys, and sequential access in key or reverse key order.

Forms-990 is a package of functions and subprograms which simplify the development of forms-oriented input routines. The Info-990 interactive data base system enables office personnel to create and maintain a variety of data bases by menu specifications.

Mail-990 costs \$500, Text-990 costs \$100, Index-990 with source code costs \$800, Forms-990 costs \$500 and

Info-990 costs \$800 from Synergistic Systems, Cobble Hill Road, E. Thetford, Vt. 05043.

'Ramis II' Added To MMDS Net

BETHESDA, Md. — Martin Marietta Data Systems (MMDS) has expanded its time-sharing services network with the addition of Ramis II, a decision support software system for nontechnical users.

The product combines a data base management system with an English-like language geared for the business vocabulary of the nontechnical user. Ramis II enables new applications to be implemented five times faster and reports 40 times faster than do conventional computer languages such as Cobol and Fortran, MMDS claimed.

Prices for the system vary broadly, but are based on computer time, priority of service and the particular customer configuration, MMDS said from 300 E. Joppa Road, Baltimore, Md. 21204.

Course Cassette Out

ARVADA, Colo. — Educassettes, Inc. has announced the release of File Merges, the second module of the Model Program Series.

Utilizing the Warnier-Orr program design technique, this self-study audio cassette course traces the development of a generalized design for file merges.

The course, with illustrated workbook, is priced at \$59. Discounts are available for quantity orders. Educassettes said from Suite 102, 6777 Wadsworth Blvd., Arvada, Colo. 80003.

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Pascal Updated For DG Gear

NEW YORK — Rational Data Systems, Inc. (RDS) has announced its Release 2.10 of Pascal for Data General Corp. computers. This latest revision of RDS Pascal features facilities for assembler interface and the separate compilation of procedures and functions, RDS said.

RDS Pascal is the only Pascal available for all DG disk-based systems, a spokesman claimed. The one-time license fees are \$2,500 for the RDOS version and \$3,500 for AOS.

The details of the assembler interface to RDS Pascal are explained in the third issue of "RDS Pascal Newsletter." RDS is located at 245 W. 55 St., New York, N.Y. 10019.

Bookkeeper Fits TI Machines

RALEIGH, N.C. — Business Application Systems, Inc. has announced an upgrade to its BAS Bookkeeping System, a five-module software package for first-time users.

Designed to automate payroll, inventory, general ledger, accounts receivable and accounts payable, the BAS Bookkeeping System is available on Texas Instruments, Inc., floppy disk terminals 771 and 990/1, 990/4, 990/6, 990/8, 990/10 and 990/12, running under the DX10 operating system.

Both hardware and software are available from the firm. Hardware prices range from \$27,000 to \$100,000. The software package costs \$4,000 from 7334 Chapel Hill Road, Raleigh, N.C. 27607.

Package Integrates Medical Data

KING OF PRUSSIA, Pa. — Shared Medical Systems Corp. has added a management reporting package to its general ledger package.

The package integrates complete financial information with statistical information in one data base. Patient billing, payroll, census and inventory data is automatically fed into the general ledger, the firm said.

The shared batch system, with the general ledger and management reporting packages, costs \$225 a month plus an additional 10 cents per patient-day. Current users can add the management reporting system for an additional 4 cents per patient-day, the firm said from 650 Park Ave., King of Prussia, Pa. 19406.

Dictionary Uses Listed

LEXINGTON, Mass. — A 125-page book about data dictionary applications is available from MSP, Inc.

The *Data Dictionary in Systems Development* consists of a general overview of the topic and seven presentations on associated subjects given at Datamanager user group meetings.

While the only data dictionary specifically identified is the Datamanager, the book is said to contain information on concepts and implementation approaches that could apply to any data dictionary system.

The book costs \$15 from 21 Worthen Road, Lexington, Mass. 02173.

At INCO,

ADABAS

Inco's DBA tells why ADABAS, Software AG's data base management system, was chosen for the expanding needs of this international firm.

"Five years ago, we chose ADABAS from Software AG as our data base management system. We demanded a highly flexible, end-user oriented DBMS that would facilitate the development and operation of our business systems. We did not have the time to design our own DBMS, or the luxury of selecting a system that would require a large staff to implement and support. We needed an easy-to-use package with the design phase already accomplished. The available studies indicated to us that ADABAS would be the best choice for our needs. Five years of experience showed us that the studies were right — and so were we in choosing ADABAS."

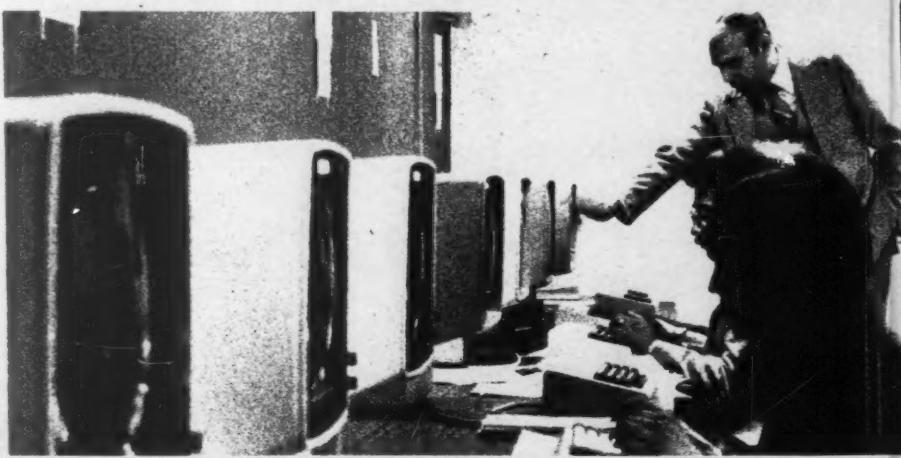
Exceptional flexibility, easy maintenance

"During the development stages of our many application systems, the specifications often changed. We were constantly adding fields and files, or changing their locations in the data base. With ADABAS, these changes are very simple to make. There are no cumbersome chain pointers, so relationships can change according to need."

"In fact, we are continuing to modify our systems to meet our expanding corporate requirements. And with ADABAS, we can make these necessary changes with little or no impact on the hundreds of batch and online programs supported by the DBMS."

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"In planning new applications, we do not have to include the high cost overhead for restart/recovery, security, or data base



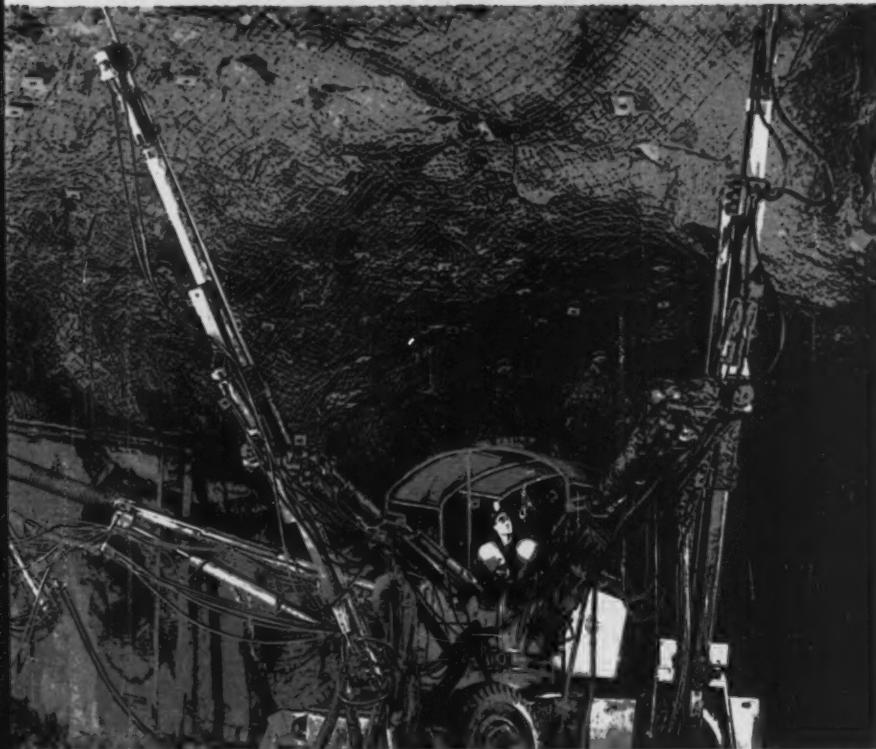
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loading. These utilities are all included in ADABAS already. Applications programming is faster and easier, too — because ADABAS provides the tools. This means we can concentrate on the application problem — not the data base.

"ADABAS gave us a powerful end-user query language — ADASCIPT+, an interactive report generator — ADACOM, and an online Data Dictionary all in the same package. And recently we have added NATURAL, Software AG's instant applications language, which we expect will decrease development time. Furthermore, the ADABAS system can be fully installed in a single day!"

High company-wide productivity

"ADABAS is up and running at Inco 18 to 20 hours every working day. The system is used daily by literally hundreds of end users and programmers alike. Each day, our New York installation processes more than 400,000 data base commands from departments like accounting, personnel, marketing, customer information, shipping and billing. With all this intense activity, ADABAS is supported by only three people: a data base administrator, a data base analyst, and a data dictionary analyst."

ADABAS: Datapro Honor Roll winner for three years

At Inco, ADABAS has cut both program development time and cost. In fact, the exceptional ease-of-use of ADABAS, combined with its outstanding throughput efficiency and adaptability, helped give this product such a high user rating that ADABAS has been nominated to the Datapro Honor Roll for three consecutive years.

If you'd like to know more about how ADABAS met Inco's demand for a truly adaptable DBMS, send for Software AG's ONLINE report today. You may find that ADABAS is the ideal data base management system for a demanding company like yours, too.

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Type of Computer

Operating System

Cobol Precompiler Designed To End Redundant Coding

RED WING, Minn. — A Cobol compiler designed to eliminate redundant program coding has been introduced by Twin Oaks.

SPRCBL, the precompiler, uses propagation, abbreviation, generation, substitution and alignment to reduce the time it takes to produce an average program by one-half, the vendor claimed.

For instance, data name propagation eliminates the need to rewrite the data name in the object of a move or data transfer statement, and paragraph name propagation reproduces the body of the name throughout multi-paragraph routines, a spokesman said.

Input to and output from SPRCBL can be card, tape or disk. It has been

installed on Burroughs Corp., IBM, Data General Corp. and Hewlett-Packard Co. computers.

The product is available for a 30-day trial and can be leased for \$50/mo or \$1,250 perpetually, the vendor said from 269 Cannonview Drive, Red Wing, Minn. 55066.

On-Line Package for System/34, System/38 Aids Manufacturers

SANTA ROSA, Calif. — Data 3 Systems, Inc. is offering MRPS 34/38, an on-line manufacturing resource planning package for IBM's System/34 and System/38 processors.

'Screen Builder' Runs On DEC VT-100 Terminal

DENVER — A data entry and forms management aid for application programmers has been announced by Taliant Associates, Inc. Written in Basic Plus-2 and Macro-11 and running under the RSX-11M operating system with RMS-11K on Digital Equipment Corp. PDP-11 minicomputers, Screen

Builder runs interactively on DEC's VT-100 terminal.

Screen Builder was designed to increase programmer productivity by decreasing the significant amount of time required in the repetitive coding of screens and forms, according to the vendor.

It reportedly is effective in formatting question and answer, menu, inquiry, output or fill-in-the-blank type forms. The price of \$3,200 includes the Screen Builder modules and a disk resident Screen Builder Library.

The firm is located at Suite 308 S., 3010 W. Sixteenth Ave., Denver, Colo. 80204.

Basic Four Minis Get 'Omnidata'

STERLING, Va. — Berman Associates has announced an interactive data management package for Basic Four Computer Corp. minicomputers.

Omnidata handles list-oriented data such as mailing lists, personnel files and inventories.

The package costs \$1,995 from Berman at 101 E. Holly Ave., Sterling, Va. 22170.

GE Updates PC/70 for Geisco

PHILADELPHIA — The latest version of PC/70 for Geisco, General Electric's time-sharing service, is available from Atlantic Software, Inc. PC/70 is a project resource management information system.

Critical path methodology, a processing and interactive reporting feature for tabular and bar-chart graphic reports, has been added to the package.

Report Retrieval Enhanced

On-line Report Retrieval has been enhanced to permit page alignment with CRTs and teleprinters ranging from 80 columns by 24 lines to 132 columns by 66 lines and every combination in between, a spokesman said.

The price of PC/70 is based on resources used. Atlantic reports its average customer spends \$1,800/mo. New users must also attend a two-day training course in Philadelphia for a charge of \$300 per attendee.

If desired, the course will be taught in-house for \$2,000 plus travel and expenses, the vendor said from Lafayette Building, 5 and Chestnut Sts., Philadelphia, Pa. 19106.

Newsletter Publishes Listing of Software

BETHESDA, Md. — A listing of software publishers and the types of programs they buy is being started by the Computer Consultant newsletter/directory.

Free-lance programmers who want to sell software they have written or who are trying to gauge the market for particular software will now have a reference guide on who's buying what, the publisher said.

More information is available from Battery Lane Publications, P.O. Box 30214, Bethesda, Md. 20014.

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COM Tool Frees CPUs From Converting Output

ANAHEIM, Calif. — A computer output microfilm (COM) software package that is said to free the CPU from having to convert data intended for line printer output has been introduced by California Computer Products, Inc.

The Microfiche Management Software (MMS) is an assembly language program designed for the Model 930 off-line controller driving a Calcomp Model 1681 high-resolution COM printer/plotter. The program can be modified by Calcomp to be compatible with most host computer systems, a spokesman claimed.

MMS is provided on floppy disk and accepts CPU-generated information on any standard 9-track 800- or 1,600 bit/in. tape in either NRZI or phase-encoded format. Output can be 105mm microfiche or 16mm film.

Subroutine features of the software include the ability to produce index pages, eye-readable titling and file and column breaks. All of the subroutines are geared to respond to operator-selected parameters.

Finally, the software provides continuous flashing of the CRT image and the hardware form, letting the operator align data with the form while viewing both displays.

The MMS package costs \$3,600 on a one-time lease and can be obtained from Calcomp at 2411 W. LaPalma Ave., Anaheim, Calif. 92801.

Broadcasting Package Designed for IBM 5120

OPELIKA, Ala. — Datacount, Inc. has introduced a software package for IBM 5120 small business computers that is geared to handle the business and traffic scheduling chores in radio broadcast applications.

The Datacount Accounts Receivable and Traffic Scheduling (Darts) software operates on a 5120 with 32K bytes of memory and includes traffic scheduling with program log generation.

The cost of the system is \$7,500 which includes on-site installation and training, documentation and a subscription to future system enhancements, a Datacount spokesman said.

woman said from the firm at 2207 Anderson road, Opelika, Ala. 36801.

Researcher Aided

SHAWNEE MISSION, Kan. — The Customer Satisfaction Research Institute (CSRI) has added a statistical processing service to its line of DP services.

Called Accutab, the no-charge in-house addition offers CSRI clients quick turnaround of questionnaire and survey analysis data.

The vendor is at Suite 107, 4901 College Blvd., Leawood Manor/Shawnee Mission, Kan. 66211.

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Enhanced Ansi '74 Version

RJ-11 Cobol Runs on PDP-11s

SUDSBURY, Mass. — RJ-11 Cobol, an enhanced Ansi '74 standard version for Digital Equipment Corp.'s RT-11 operating system, is available from EEC Systems.

Consisting of a compiler, run-time system and supporting programs, it runs on DEC PDP-11 computers.

The product was designed for small business applications and combines the advantages of Cobol with relatively inexpensive hardware, such as

floppy disks, the vendor said.

The language implementation includes: INSPECT, STRING and UNSTRING verbs; SORT verb; condition names; COMPUTE verb; complex conditions; expressions; program chain and overlay functions; 16 decimal places of arithmetic accuracy; COPY verb; and character, packed-decimal and binary representation of data.

RJ-11 Cobol also features several facilities not available

in the Ansi standard such as provisions of two types of indexed-sequential files suitable for different applications and two different techniques for processing files with variable length records, suitable for different file devices, the vendor claimed.

Also available is an interactive, dynamic debugging facility for tracing the operation of programs and automatic line counters to simplify report generation.

In addition, utility programs are provided to print the contents of files or program results; sort files; create files; update files; print file details and extend files.

The product is priced at \$2,500, the vendor said from 315 Goodman's Hill Road, Sudbury, Mass. 01776.

Restaurant Software Geared To Point-of-Sale Systems

LOS ANGELES — A software program for the food service industry and tailored to point-of-sale management control systems with non-printing remote terminals has been developed by AM International's Documentor Division.

Users can record and process up to 250 open accounts, record sales made with six types of charge cards and utilize various tax tables stored in memory, the firm said.

Restaurant managers can maintain timekeeping records for up to 100 employees in six payroll categories and monitor revenue and productivity of up to 40 waiters and waitresses. The software provides more than 30 reports covering operations, complete revenue and inventory control, costs of goods, waiter productivity and timekeeping.

Designed for systems using the AM Documentor 3276 remote nonprinting terminal, the software evolved from the 3225M program currently available for restaurants.

The cost for one nonprinting remote terminal is \$5,300 and the price ranges up to \$20,000 depending on the number of

terminals and options purchased, the vendor said from 1900 Ave. of the Stars, Los Angeles, Calif. 90067.

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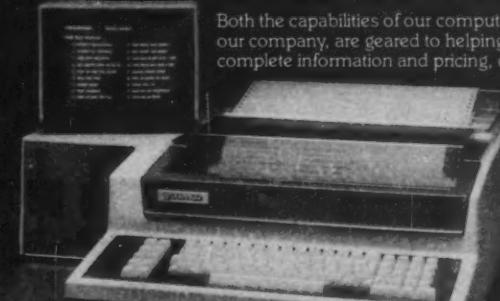
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Defines 25 Development Roles

'Stradis' Eases Structured Methods

NEW YORK — Improved System Technologies, Inc. is offering a structured methods approach to system development. The Stradis development

package integrates data flow analysis, structured design, structured programming, structured walk-throughs and top-down development, the vendor said.

Stradis defines 25 roles that must be played during system development, installation and maintenance.

The suggested roles are accompanied by briefings and implementation techniques such as data flow diagrams, the vendor said.

The development aid is also said to improve user involvement in system development and cut down the amount of paperwork usually generated while a system is being built, according to the vendor.

Stradis costs \$25,000, but special prices are available for smaller firms.

Improved Systems Technologies is at 888 Seventh Ave., New York, N.Y. 10106.

Program Helps Implement Structured Techniques

BOSTON — A program for implementing structured techniques for systems development is available from The Structured Technologies Group.

The program is designed to attack the problems of building systems: low productivity, cost of maintenance, poor communication and inadequate project control.

It focuses on requirements definition, and functional and architectural design.

The approach utilizes structured tools, such as a graphics modeling technique for functional decomposition, a real-time review and validation cycle and dynamic documentation.

The price is based on the size of the analysis staff to be trained, consulting time required and the complexity of the particular project, Structured Technology said from 89 Franklin St., Boston, Mass. 02110.

The price is based on the size of the analysis staff to be trained, consulting time required and the complexity of the particular project, Structured Technology said from 89 Franklin St., Boston, Mass. 02110.

Oil and Gas Package Fits AM-Jacquard Hardware

OKLAHOMA CITY, Okla. — An oil and gas financial and accounting package for the AM-Jacquard line of hardware is available from Professional Programming Systems, Inc.

Features of the package include general ledger, joint interest billing, revenue disbursements, windfall profits tax, accounts receivable, accounts payable, payroll, lease records, land management and delay rentals.

The package is fully integrated with AM-Jacquard's Type-Rite word processing software and allows increased

System Processes Auto Policies

PHILADELPHIA — An on-line automobile insurance policy processing system is available from General Data Systems, Ltd. FAM-V Commercial is suited for either distributive processing in field offices or as a completely integrated system, the vendor said.

Running under IBM communications software, FAM-V Commercial automates such facets of the commercial automobile policy writing business as classification and rating, policy insurance, renewals and endorsements, billing and premium accounting and balancing and control reports.

The base price for the system is \$150,000, subject to change with user configurations, the vendor said from 1520 Locust St., Philadelphia, Pa. 19102.

edly demonstrates a new methodology for structuring standard Fortran modules.

Termed Functional Blocks, the methodology is said to permit the user of standard Fortran to achieve modules that are as understandable and maintainable as that claimed by the users of the so-called structured Fortrans.

The brochure, entitled "Structuring Fortran Modules by Functional Blocks: An Overview (and a Comp-Aid Service)," first presents a brief management overview.

The brochure costs \$15 for the first copy, with written permission available to make as many in-house copies as desired. Comp-Aid is located at 3330 Orlando St., Corpus Christi, Texas 78411.

CCP ANNUAL EXAMINATION

SCHEDULED FOR DECEMBER 13, 1980

The annual examination for the Certificate in Computer Programming (CCP) will be held on December 13, 1980, at selected test centers throughout the world.

Specific requirements for this year's examination are detailed in the "Certificate in Computer Programming Examination Announcement and Study Guide." The study guide and application form for the 1980 examination are available on request from CCP.

Deadline for Filing Application is October 15, 1980

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Links 200 Terminals

Switched Net Cuts Footwork on Campus

TEMPE, Ariz. — When Arizona State University (ASU) discovered many of its 38,000 students were running from one end of its campus to another to use several computer systems, school officials decided something had to be done.

The obvious solution was a network, but there was a hitch. The University's mainframe population consists of one IBM 370/158, one IBM 3031, three Digital Equipment Corp. PDP-11/70s, a large Univac 1100/42, another PDP-11 network for independent teleprocessing, plus a few smaller PDP-11s dedicated to word-processing applications — and some 200 terminals.

"The problem was in giving students at Site A access to a computer at Site B. It was extremely difficult to assign people to machines and not force them to make long treks across campus or across town to access the other computer systems," according to Darel Eschbach, the school's director of computing. "With a mixed configuration, however modern, you essentially face the same problem you have with batch systems — getting to the computer."

Two Alternatives

"We knew we could go one of two ways: Either put in an awful lot of terminals and enough copper to string every terminal to every processor or go to a sophisticated switched network. We were also faced with requests to install dozens of additional terminals so that peak loads at the remote sites could be handled.

"The costs of terminals and, more importantly, the cost of space were major concerns," he recalled.

"The added requirement to convert the Univac applications to operate on the Model 158 mainframe — in preparation for switching both the Univac and IBM work loads to an Amdahl Corp. processor — forced our hand," he said.

"Installing a switched network was one of the best decisions we ever made," Lynn Bellamy, Arizona State's assistant vice-president for computer services, said. "The new facility promises students, faculty and administrative users access to all computer resources from any terminal location.

"In addition, it seems to be cutting energy and labor expenditures, reducing communications costs, and greatly increasing message efficiency due to its new message broadcasting capabilities," he noted.

The unnamed network, which is based on an M3200 integrated networking system from Tran Telecommunications Corp., has already been expanded to link over 200 terminals and computer ports to each other, and this number will more than double in the next few months.

Initially installed with a Tran M3201 network processor and six M3211 network access concentrators, the network is taking on a dual-node form with another M3201 processor and four more concentrators.

According to Bellamy, another key consideration in choosing an integrated network was that of pulling essentially all of the security checking out of the hosts, saving that wasted overhead in those machines.

"Our experiment determined that the network did all of those things that we wanted it to, including providing increased security," Eschbach said, "and it proved a real boon to the conversion process. Users can begin with an all Univac application mix and convert programs to IBM compatibility one at a time. Their existing DEC LA36 terminals access either machine easily through the Tran network processor.

"Similarly, they can put jobs on the DEC computers in the same manner, since the network has purposely been kept transparent to the applications."

That transparency will always be a valuable asset, Eschbach maintained, but ASU may not always limit its network to data transport services. "The opportunity, with all that intelligence available in the network, is always there for doing other things with it."

NCR Net Transfers Financial Data

DAYTON, Ohio — NCR Corp. has unveiled a system designed to help banks reduce the number of paper checks written and cut down on courier services required to transport magnetic tapes containing financial data among businesses, banks and the Federal Reserve System operated automatic clearing house (ACH) communications network.

The Federal Reserve System currently operates ACH networks in every state except New York. The purpose of the network is to electronically transfer financial information.

Payments being sent through the ACH network include Social Security deposits, government payments, insurance premium payments and direct payroll deposits.

While there is direct data transfer among the various ACH facilities, courier services are required to transfer tapes from corporations to their banks and the ACH facilities.

detects Data Errors

Besides eliminating the need for courier services, the NCR system, called 74530 ACH, aids in the detection and correction of errors in the data, the vendor claimed.

Using the system, information can be automatically sent from the organization originating the transaction to the bank. The 7530 can then transmit the data directly to the Federal Reserve's ACH.

While acting in a processing and communications mode, it is

able to receive or transmit data without the need for an operator and can be automatically dialed up by another system. It can communicate with NCR computers or other systems adhering to several different protocols.

A typical system including processor, keyboard, visual display screen, cassette tape unit, magnetic tape drive and communications adapter costs approximately \$16,000, the vendor said from Dayton, Ohio 45429.

Racal-Milgo Introduces Statistical Multiplexer Line



The Omnimux Series

MIAMI — Racal-Milgo, Inc. is now offering a series of statistical multiplexers designed to provide advanced management and performance features for data communications networks.

The Omnimux series consists of three basic models: Omnimux 80, which offers eight channels; Omnimux 160, with 16 channels and Omnimux 320, a 32-channel unit.

Each is capable of multiplexing a mixture of asynchronous and synchronous data with full protocol transparency, with all channels operating up to 9,600

bit/sec, and with the aggregate link running up to 19.2 bit/sec, the vendor claimed.

Advanced management features include a variety of diagnostics, statistical reporting, remote control and ease of operation. For statistical reporting, data on both individual channels and aggregate links are continuously accumulated and available from local or remote units via the front-panel display.

The price of one eight-channel Omnimux is \$3,850, the vendor said from 8600 N.W. 41st St., Miami, Fla. 33166.

Data Bits

RCA Globcom Asks To Extend Telex in U.S.

NEW YORK — RCA Global Communications, Inc. (RCA Globcom) has filed with the Federal Communications Commission (FCC) to extend its direct international telex, telegram and leased channel services to six more U.S. locations, increasing to 32 the number of metropolitan areas to which the company provides direct overseas operation.

The six new metropolitan areas are Anaheim and San Diego in

California; Charlotte, N.C.; Indianapolis; Phoenix; and New Brunswick, N.J.

IDC Issues X.25 Study

WALTHAM, Mass. — "X.25: The Unknown," a study that reportedly discusses the latest developments in telecommunications standards in layman's terms for the nontechnical executive, has been released by International Data Corp. (IDC).

Researched and written by Ron Frank, a telecommunications consultant and journalist, and

John Gantz, IDC's director of publications and editor of its Distributed Processing Reporting Service, the study explains the evolution of the X.25 standard, discusses differences within the standards world and offers "Who's Who in the Standards World."

The report is part of IDC's Distributed Processing Reporting Service, but is available to non-subscribers for \$125. More information is available from George Pardi at IDC, 214 Third Ave., Waltham, Mass. 02254.

COMMUNICATIONS

Terminal Has Touch Pads

NEWTONVILLE, Mass. — A touch-sensitive CRT terminal designed for public access is available from Interaction Systems, Inc. The terminal reportedly simplifies interactive dialogue and eliminates the need for a keyboard.

The screen of the microprocessor-based unit is divided into multiple transparent capacitive touch pads. All switches, adjustments and cable connections are inaccessible to prevent tampering, the vendor claimed.

Equipped with a program-selectable two-page display memory, the Z80-based terminal incorporates a high-resolution 15-in. CRT screen and a 10 by 14 dot matrix. Full upper- and lowercase ASCII character set is standard, and customer specified fonts up to 240 characters are available.

The price for the terminal is \$2,800, the vendor said from 24 Munroe St., Newtonville, Mass. 02160.

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ASCII POS Terminals Give Interactive Capability

RALEIGH, N.C. — Perry Data Systems, Inc. has unveiled an ASCII asynchronous point-of-sale (POS) terminal that reportedly provides interactive communications POS capability with computer-controlled receipt printing and program control of up to four cash drawers.

The 16-line by 80-char. display gives access to inventory, pricing and sales data communicating with the Data General Corp. 6052 control character set. The attached keyboard and 10-key pad feature yes/no keys for menu-driven software to speed customer handling, the vendor claimed.

DG Adds Three Products For Micronova

WESTBORO, Mass. — Data General Corp. has introduced three communications products geared to enhance the flexibility and hardware support of its Micronova MP/100, MP/200 and Micronova board computer (MBC).

The first product, an asynchronous/synchronous line multiplexer (ASLM), has four serial communication lines with modem control. Each of the four lines supports either character-controlled synchronous protocols (including IBM bisynchronous) or asynchronous communications. The device can operate at 19,200 bit/sec in either mode, a spokesman claimed.

The second introduction is a four-line asynchronous interface that is designed for use in network applications or as a terminal concentrator.

All line characteristics of each of the four asynchronous interfaces are said to be fully programmable with a maximum operation speed of 19,200 bit/sec. Line interfaces meet EIA RS-232C specifications, the spokesman added.

Finally, DG unwrapped a communications software package which supports up to eight synchronous communications lines. The MP/OS synchronous communications package (MSCP) supports ASLM on the Micronova.

The ASLM costs \$750 while the asynchronous interface is priced at \$600. The MSCP software sells for \$500 with an initial license and \$100 for a run-time license, the spokesman said from the company at Rt. 9, Westboro, Mass. 01581.

ATMs Extended

DALLAS — Docutel Corp. and American Express Co. have jointly announced an automated teller machine (ATM) capability that will enable financial institutions to issue American Express Travelers Cheques, as well as cash, on a 24-hour, seven-day-a-week basis.

The feature uses Docutel's Total Teller 2300 ATM and costs \$150 from the vendor at P.O. Box 222306, Dallas, Texas 75222.

Micro600 Gets Option

CHATSWORTH, Calif. — Micom Systems, Inc. has announced a Monitor Port Option for the Micro600 port selector, its intelligent terminal-controlled matrix switch.

The option extends the capabilities of the Micro600 by allowing it to be used to monitor data activity while a connection is in progress, using commercially available data monitors such as Spectron Corp.'s Datascope. The option adds "patch and monitor" capability to the Micro600 port selector.

The Micro600 is available in a tabletop enclosure for single minicomputer installations and in a floor-standing cabinet for larger installations supporting several hundred computer port and terminal connections. The tabletop version ranges in price from \$6,000 to \$10,000; prices for the floor-standing model start at \$10,000, Micom said from 9551 Irondale Ave., Chatsworth, Calif. 91311.

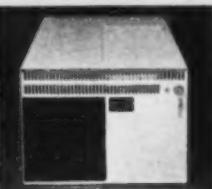
HEX-29

The HEX-29 from DIGITAL MICROSYSTEMS is a low cost, high power data processor. Priced like a microcomputer, the HEX-29 is a multitasking, multiuser, time share computer.

The powerful bipolar bit-slice processor includes 16 or 32 bit integer and 64 bit floating point operations, multi-byte/character string processing, transition table instructions and more. HEX-29 will accommodate bit, nibble, byte, word, double word, quad word and variable field operations.

The micro-programmed HEX-29 is a complete system with an expandable complement of powerful software tools.

The HEX-29 is a feature-packed minicomputer suited for business or scientific applications.



CONTACT: Ernest Lorens, DIGITAL MICROSYSTEMS, 4445 Piedmont Avenue, Oakland, CA 94611 (415) 650-8650

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TEXAS INSTRUMENTS

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DCP 2050 Models Links

CHERRY HILL, N.J. — Datatel, Inc. has introduced the DCP 2050, a data link simulator that models terrestrial or satellite communications links and inserts delays and introduces errors so users can determine what effects various characteristics will have on their protocols.

Delay and error settings are also independently switch-selectable. The DCP 2050 will inject errors of various lengths.

The unit will test half- and full-duplex protocols and costs \$2,700 for RS-232 interfaces.

An optional CCITT V.35 interface is available for \$500, the vendor said from 2005 Greentree Road, Cherry Hill, N.J. 08003.

Modem Geared To Private Lines

SUNNYVALE, Calif. — A multispeed modem for use on private-line, short-haul data communications circuits is available from Prentice Corp.

The SLD-MKII modem is four-wire, full-duplex, or two- or four-wire half-duplex in point-to-point or multi-point/poll modes.

Available with switch-selectable data rates from 2,400 bit/sec to 28,800 bit/sec, the modem is said to be a low-cost, direct replacement for Western Electric Co. 201, 208, 209 and 301 modems.

Designed for distances up to 20 miles, the unit costs from \$600 to \$670 for the 9,600 bit/sec model to \$880 to \$950 for the 28,000 bit/sec modem. Prentice is at 266 Caspian Drive, Sunnyvale, Calif. 94086.

Modem Serves Short-Range Links

WHEELING, Ill. — Gandalf Data, Inc. is offering a synchronous modem for short-range point-to-point communications links.

The LDS 329 will transmit data up to eight miles over dedicated four-wire unloaded lines at switch-selectable speeds of 2,400-, 4,800-

or 9,600 bit/sec. Other features include constant carrier operation, an internal crystal clock and phase lock loop for added stability, the vendor said.

The LDS 329 costs \$450 from the vendor at 1019 S. Noel Ave., Wheeling, Ill. 60090.

Taper Group Sets Fall Schedule Of Systems, Network Seminars

ATLANTA — The Taper Group, Inc. will conduct a series of seminars on DP and data communications September through December.

A three-day course entitled "Datacomm II" will be held Sept. 17-19 in

Atlanta; Oct. 22-24 in St. Louis; Nov. 19-21 in Charleston, S.C.; and Dec. 10-12 in Pensacola, Fla., at a price of \$350 per student.

"Understanding Data Communications Network Components," which identifies and describes more than 25 network components, will be held Oct. 27-28 in Atlanta for \$375 per attendee.

"Understanding the Equipment Acquisition Process" will be held in Atlanta Oct. 29-30 for \$375 per student.

The Taper Group is located at 2433 Hawthorne Drive N.E., Atlanta, Ga. 30345.

Fallback Switch For RS-232 Lines

NORWALK, Conn. — A fallback switch that permits push-button switching of RS-232 data lines between communications and/or terminal equipment has been introduced by Datacomm Management Sciences, Inc.

The FS-25 unit switches all 25 signal leads of the RS-232 interface.

A passive device, the switch requires no operating power and is transparent to all data rates through 19.2K bit/sec. The FS-25 costs \$100 from the firm at 181 Main St., Norwalk, Conn. 06851.

Aydin Offers Error Tester

FORT WASHINGTON, Pa. — Aydin Monitor Systems is offering a bit error rate tester that can generate and compare digital data at rates from 100 bit/sec to 5M bit/sec.

Directed at users of low-speed wire communications or high-speed satellite communications, the Model 852B features signal generation, signal perturbation, signal comparison and data quality readout.

The cost of the Model 852B begins at \$8,500, Aydin said from 502 Office Center Drive, Fort Washington, Pa. 19034.

3Com Book Lists Local Net Vendors

MENLO PARK, Calif. — A book that lists more than 40 vendors of network components and systems, including transceivers, modems and communications software, has been published by 3Com Corp.

The *Local Computer Network Vendor List* is a compilation of manufacturers that supply products that fit within the loosely defined category of local computer networks.

The book is available for \$125 from 3Com at 3000 Sand Hill Road, Menlo Park, Calif. 94025.

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The Programmer/Analyst Is an Endangered Species

By Lawrence H. Cooke Jr. and Joseph P. Campaniello

Rarely do banking organizations innovate in labor productivity. Most of the time, data processing in banks is viewed as less innovative than, say, in universities or in manufacturing.

However, there are profound changes occurring in the data processing function within banking organizations. The transformation is moving so slowly and naturally that most observers are unaware of the fundamental nature of the shift. The key to this phenomenon is the emergence of the customer services representative (CSR).

One might trace the original CSR to the hardware vendor's systems engineer (SE). These individuals represented the vendor in dealings with the customer on a long-term basis, while the salesman concentrated on pure selling. The SE provided continuity with the client and established a detailed level of communication over long periods of time.

Evolving somewhat later were customer service personnel at time-sharing companies. These individuals also served to augment the sales staff but the emphasis shifted to addressing the user's software needs, rather than explaining how to utilize hardware.

The banking model for the CSR moves entirely away from the sales role. As we shall see, the function of user liaison is autonomous. This has positioned the CSR to be a coincidental predator to the species called the systems analyst.

Stated bluntly, the systems analyst job is obsolete and is going the way of the dinosaur. The systems analysis function is shifting to the user. The CSR is the liaison between the technical programmer and the user. These representatives have unique "survival of the fittest" qualities.

To be convinced of the impending extinction of the nontechnical systems analyst, one need only turn to the Help Wanted section of any newspaper or trade publication and seek the following ad (here satirized only slightly):

Wanted: "Nontechnical systems analyst; programming experience must be nonexistent or at least 10 years old. Duties consist of misinterpreting users' requirements, introducing delay and policing user areas to make sure programmers do not contact users directly. Salary commensurate with de-

suetude."

An ad like that, if it exists, is buried among thousands of ads seeking programmer analysts. DP shops may even encourage any nontechnical systems analysts they have on board, but nobody is looking very hard for them in the marketplace. The systems analyst pool is drying up slowly, and those in that pool will survive only by adapting to the technical ranks or by becoming users.

To notice evolution, a long view must be taken. In the '50s, programmers were mathematicians who coded in "actual." Cobol was invented in 1959 to eliminate programmers, so that any Jack or Jane in the user area could write programs. Well, that did not happen, except perhaps in accounting. In the '60s, programming became more complex. To deal with that world, applications and systems programmers were differentiated. Programmers raided the user areas and installed technically elegant systems that didn't serve users' needs very well.

In the '70s, DP "came of age." Systems analysts blossomed and systems improved. But in the '70s, computers had improved a millionfold over the prototypical models, and 10,000-fold over the '60s alone. Most systems analysts simply could not keep up. Instead of facilitating DP growth, they began to impede it. As a group, they failed both as users and as programmers. The natural selection process must lead them to follow the "actual" coding mathematician and the user-Cobol writer into the DP museum as interesting but defunct species.

Moving Into Void

Imperceptibly, the customer services representative is moving into the productivity void left by the retreating systems analyst. Through increased generalization of the CSR, rather than through the narrowing specialization of the systems analyst, we believe (in DP as in the physical environment) that generalization offers better adaptability for survival. This CSR hybrid will grow and flourish in the '80s.

Before we turn to the CSR, let us examine the growing evidence of the end of systems analysis as a career field.

First, there is the marketplace's lack of interest, noted above. Then, there is the unreasonable explanation of superhuman qualities for systems ana-

lysts of which we will name only a few: "organizational skills, conflict resolution, planning and control, design skills, leadership ability, comfort with all organization levels, sensitivity to politics, sympathy with company goals and empathy for technology." A recent study at MIT's Sloan School of Management noted "alarming results" for expectations of chief executives about systems analysts. The study stopped short, however, of the conclusion of obsolescence.

In our opinion, no job category can perform all those functions. There are some isolated individuals who have those skills but these are as rare as "Renaissance men." We are not pro-

posing that an organization fortunate enough to have Leonardo da Vinci on its staff should discharge him; rather, we advocate a realistic appraisal that the systems analyst's job is in fact three jobs — DPer, user and liaison (CSR).

Case of Adaptation

The appearance of the CSR function in user departments coincided with the systems analysis shift to the user. In order to prevent DP from running rampant throughout user areas, an emissary was appointed to deal with DP personnel as a way of limiting the intrusion into the daily routine. The em-

(Continued on *In Depth/2*)

User and DP Responsibilities

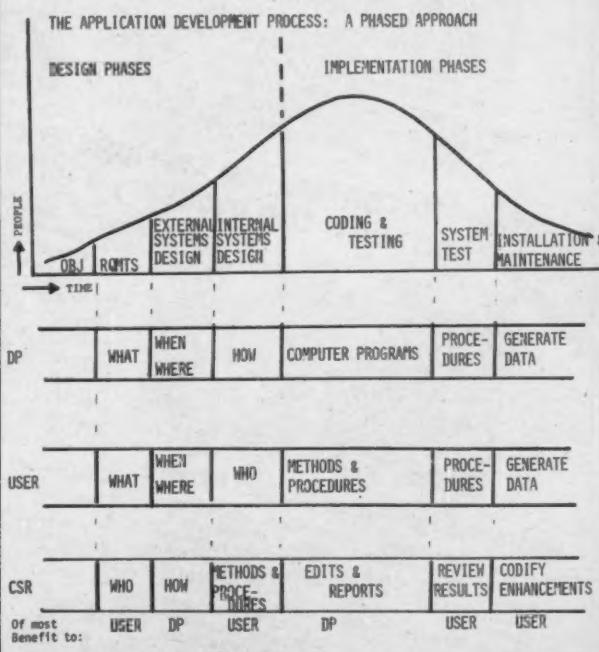


Figure 1. The top part of this chart is the traditional "life cycle" drawing of systems resources over time. The activity in the center of the chart is a view of functional role sharing between DP and the user. The bottom part of the chart shows the authors' view of the CSR liaison.

ENDANGERED SPECIES

IN DEPTH

In Depth/2

(Continued from In Depth/1)
issary became more intertwined with DP activities over the project's life.

This involvement was soon perceived to aid DP as much as or more than the user. DP recruited these individuals to propagate the techniques in different areas where users did not have intimate, detailed knowledge of a particular routine. This was found not to be too great a drawback; these individuals knew how to ask questions and take notes.

Figure 1 illustrates the process. The top curve is the project life cycle. The middle "activity bonds" show user and DP roles across the project. The bottom portion shows the CSR role and who benefits most at each stage.

Over the last few years, enlightened DPs have learned to "use the user." Also, users provided themselves with defenses against DP excesses. Feasibility studies are a symbol of the former, and formal user sign-offs characterize the latter. These mecha-

nisms evolved independent of the CSR phenomenon we are outlining; nonetheless, CSRs facilitate the process.

The CSR offers a significant comparative advantage over other groups within organizations in three basic areas. In providing a liaison between DP and the user, CSRs provide communication, continuity and credibility.

Primary Strength

Communications ability is the primary strength of the CSR. The pur-

pose of the function is, first and foremost, to communicate. Rightly or wrongly, DPs are not known for communications prowess. Most of the time, DP activity is viewed from the user side as downright secretive—or worse. CSRs break down some stereotypes through their constant contact with users.

Used effectively, the CSR has a leading role in all DP-user contacts. Commonly, the forum is a meeting. Meetings may take the form of specific project meetings, periodic status meetings or ad hoc meetings to air user concerns. Unlike the systems analyst, who is expected to pontificate for DP on the spot, the CSR usually records questions and issues which are to be reviewed later.

The communications function of the CSR is initiated, not surprisingly, at the beginning of the project. The bottommost "activity bond" of Figure 1 highlights the major focus of activity at each stage of the life cycle. In a properly functioning liaison group, the CSR acts as go-between to get the right people involved. Depending on the strength and seniority of the CSR group, the CSR may be the controlling function (that is, the project manager) or the recording secretary for DP. Below, we will illustrate some organizational options.

External Design

Formation of the project group having been accomplished, CSRs next aid DP in external system design by transmitting specs to DP in English. The maximum potential of the CSR is realized in this stage. By articulating requirements in business English, CSRs avoid the pitfalls often engendered by systems analysts. Rather than confuse the user with Cobol or pseudocode, English allows an exchange of requirements, free from mystique or jargon.

When the organization has a framework of standards, CSRs can filter a

(Continued on In Depth/4)

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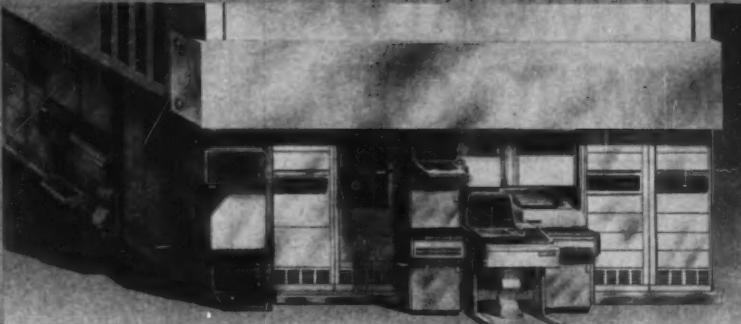
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In Depth/4

(Continued from In Depth/1)

checklist of design actions to DP in a coherent way that is not easily learned by users unfamiliar with DP parameters. Such a checklist could include volume expectations, peak vs. average loads, response time variables that are commercially viable and so forth.

Unlike the systems analyst, the CSR makes no pretense of knowing all the answers to complex technical issues; these come next in internal design and are made by DP. This deferral to the

proper stage avoids the systems analyst's tendency to execute the internal design prematurely, thereby falling either into a technical void or missing the user's real problems. English provides an effective feedback mechanism.

Preventing 'Freeze'

In internal design, the CSR devotes time to the user while DP constructs the system. The CSR has exclusive contact with the user during this stage.

Without this contact, disaster could occur.

The CSR presence counteracts a classic flaw with the systems analyst's approach: the system may be "frozen" for months and the user's needs may change unnoticed. The CSR presence with the user through the "winter of discontent," while no life seems to emanate from DP, may prevent inflexibility to user changes. This presence permits a penetration to DP for a "thaw" in the frozen specs' should it become

necessary to keep up with the user's business plan.

The CSR leaves a path open to identify which methods and procedures are required to place the DP (system) software in the user's (human) environment. Insofar as the CSR represents DP, at least someone is continuously aware of the user's environment. His prior experience with users in other system installations eases the user through the trauma of computerization.

Coding and testing shift the CSR's view back to DP. The CSR gathers test cases and highlights unusual conditions. He helps DP understand edit requirements and provides a first line of defense for the user against meaningless, unusable and incomprehensible reports. (However, we all recognize some incomprehensible reports will get through to the user notwithstanding — we are not describing perfection, but improvement.)

This interaction frees programmers from hunting down users for approvals without the iron wall systems analysts tend to build. Since the CSR's function is that of a facilitator rather than a guru, professional pride is not an issue. CSRs avoid the source of friction between nontechnical systems analysts and programmers in search of the goat: "I specified it right, but you implemented it wrong." If the CSR is not sure what the user wants, exactly, he will ask. After all, that is the job — not to pontificate or interpret the user's needs, but to communicate those needs.

Later On

Later phases have the CSR linger, when the systems analyst would usually flit away to the next project, leaving the poor programmer holding the bag. CSRs help the user interpret system test results. A new or modified system requires users to behave differently. Change is hard to accept where routine normally prevails. Having a presence in the user area during system installations (probably the same individual who was there in the design process) is very comforting to users cutting teeth on new processes.

Help over the initial rough edges may spell the difference, in user perception, between a success and a failed DP project. CSRs help smooth the rough edges by providing sympathetic on-the-scene feedback to DP which cannot be duplicated elsewhere. They can be more objective than either user or

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DP, for they neither invented the system, nor are they shackled with past traditions.

Last, in the installation and maintenance phases, CSRs provide a conduit to DP to explain and possibly rank enhancements. Properly used, they buffer DP from expensive and frivolous requests, yet they allow users to reach DP on sensitive issues.

Communications is the core of the CSR job. CSRs provide no product other than packaging user requirements to DP and unscrambling DP for users. This process may be properly viewed not as overhead but as an efficiency tool.

A paragraph of clear English is worth a box full of Cobol to most users. From the other vantage point, a crisp, ordered checklist to DP is worth a week of aimless rambling about what the old procedures used to be.

Most DP projects that are less than successful are more often the result of "failure to communicate" rather than technical flaws. CSRs help get the messages through both ways.

Concern for Continuity

With turnover as rapid as it is today, many DP shops risk total disenfranchisement from their parent organizations. Rapid turnover exacerbates the loyalty shift in DP (never strong) away from the organization at an increasing rate. Programmers generally care little about user concerns; they are technology-oriented.

Tenure in DP areas is dropping even as the industry is leaving its "infancy." (It has been only 35 years since the Eniac was developed as op-

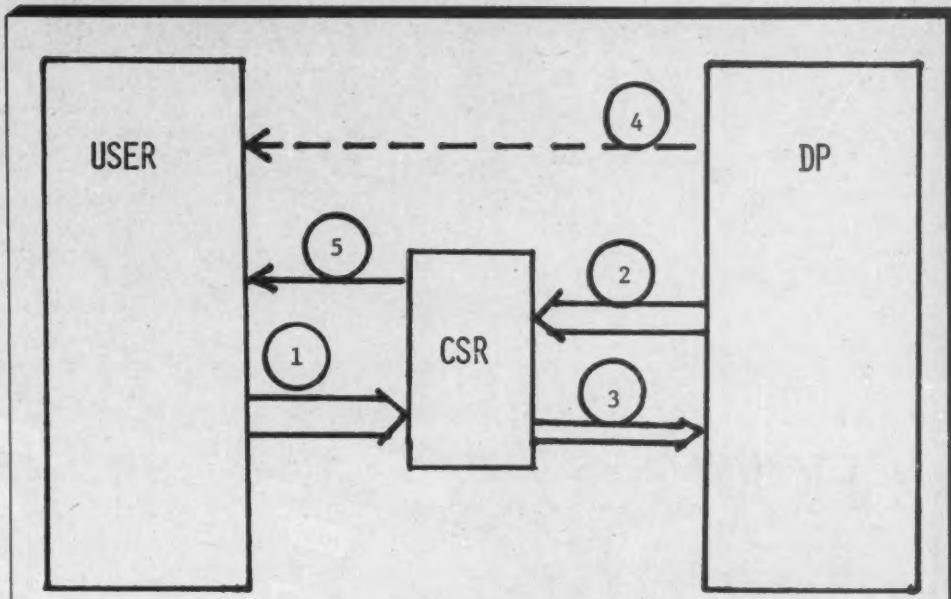


Figure 2. Personnel flows into and from the CSR area. As a general rule, the width of the arrow implies relative magnitudes of the flow.

posed to nearly 400 years since double-entry accounting.) How many DPers in your organization have the 25-year pin? How many have the 25-month pin? DPers proclivity to jump ship for the next technological mirage makes the traditional technical organization a poor reservoir for the

(Continued on In Depth/8)

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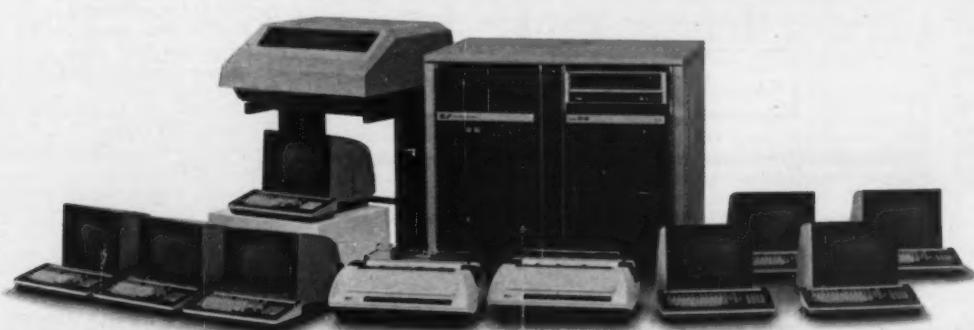
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ENDANGERED SPECIES

IN DEPTH

In Depth/8

(Continued from *In Depth/3*)

company's long-term, strategies.

On the other hand, the CSR organization has far lower turnover, retains company loyalty and identifies with the company rather than with technology. Most CSRs couldn't care a fig if a report is accessed via VSA or Tcamp or what. They certainly would not cross the street to join another company because it was using the latest buzzwords. They care about content of reports, about timeliness and about the good old virtues users know and love. If a user starts a dialogue with a CSR at the beginning of a project, there is a very high probability the same CSR will be with the company at the end of the project and available for consultations even years later. Contrast this possibility with the more standard view from the user's perspective: "Hi, I'm your fourth systems analyst. What are you guys doing on this project, anyway?" That is more typical of the high-turnover situations. The user's frustration with the constant restarts got ground zero in the high-technology approach earns DP the black eye it generally receives in those cases.

CSRs move too, but at a pace most organizations can control and live with. Basic company orientation, loyalty to the firm and product association with the user rather than to technology combine to provide continuity sufficiently long to complete projects.

More Credibility

It is easy to see how the long-term, ongoing relationship the CSR offers increases DP credibility with the user. Arrogance of the super-tech and flightiness of a succession of company know-nothings are both avoided. Technological solutions that miss the user's needs are not as likely. The CSR's ongoing presence allows for controlled changes rather than for freezing specifications for eons.

Last, company orientation permits a comradeship few DP technical staff members ever form with users. There are far more "us" sentiments to share and fewer "them" attitudes to overcome. Common goals build bridges which increase rapport and enhance DP credibility in the process.

We have tried to show that the CSR development process involves more than taking selected users and dressing them in DP uniforms. CSRs, in the main, come from the user community. However, the role of liaison is substantially different from either DP or the user structure from which most, but not all, CSRs come.

Making a Start

Any organizational entity must start somewhere. Figure 2 illustrates some possibilities of staff transfer among the user, DP and CSR groups. Clearly, to start the process, the initial transfer must be from the outer areas toward the center. Initially, the main flow is from the user to the CSR group. However, infusion of DP methodology in the CSR area is also helpful to form a

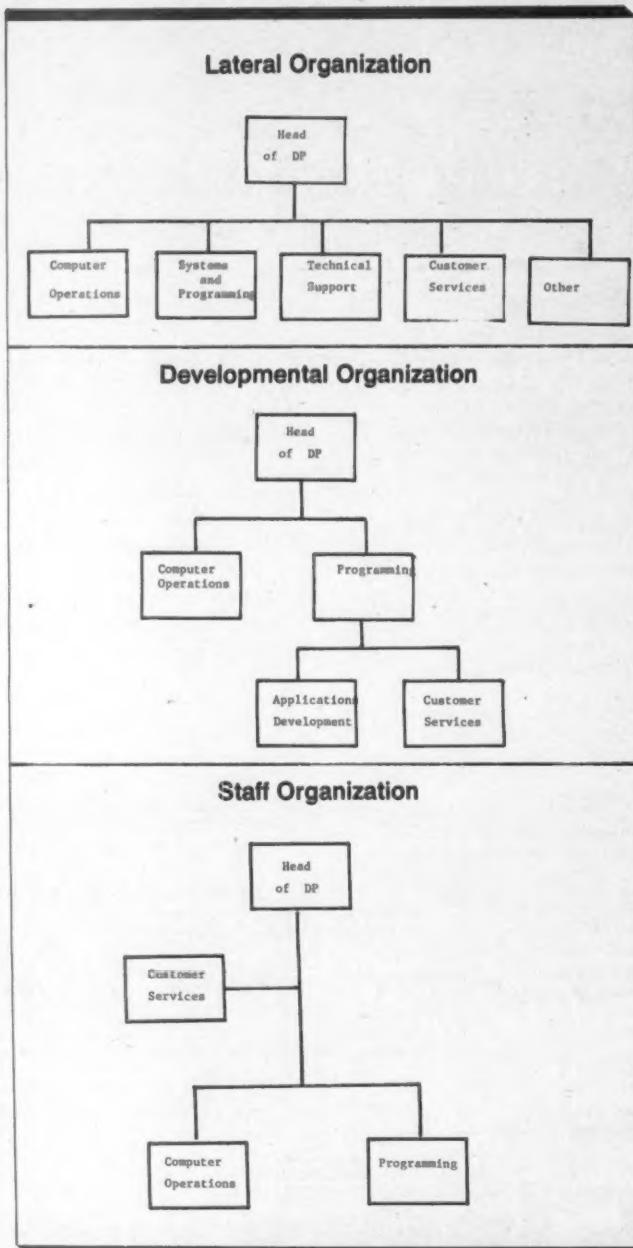


Figure 3. Organizational choices for positioning the Customer Services Group within DP. These three are not the only choices; they are merely suggestive of options available. Of these, (A) offers the most visibility within the DP organization and would probably engender the best user relations.

nucleus CSR group.

Once the organization is in place, controlled rotation of personnel is both possible and highly desirable. We know of situations where CSR personnel have become heads of DP and of major user areas. The process of flow from DP to user areas (which Bill Synott, head of Management Information Services (MIS) for the First National Bank of Boston, calls placing "Trojan Horses" into centers of the organizational structure) is greatly

enhanced by the way station of CSR training.

It links DP discipline with user concerns and sympathies. CSR training and development offers an ideal pond in which to incubate user-DP rapport.

Perhaps the most difficult task is to position the CSR relative to the user and DP. The authors have found that the best reporting relationship is equivalent to the DP technical staff, i.e., programmers and programmer/analysts. Since the orientation is toward

the company rather than toward the industry, the influence of supply and demand factors is not as noticeable on CSRs as it is on programmers.

In pay structure, the salaries of junior, experienced and senior programmers should be equivalent to those of CSRs with the same amount of experience. In our opinion, as the CSR function becomes better known, understood and sought after, salary levels will adjust. Today, the CSR function (along with systems assurance, technical writing and others) is not yet classified by nationwide salary surveys. However, this lack of clear fit of the CSR function into the organization will be corrected over time as understanding increases.

Figure 3 offers some alternatives showing how the CSR organization might be structured within DP.

The CSR function offers a way to build user-DP relationships. This process offers fresh insights into methods for closing the communications gap, both with users and within the DP organization itself, relative to the obsolescence of systems analysis.

Most organizations need look no further than within themselves. There exists a largely untapped source of talent to help stem the flow of turnover within DP. If programmers are buffered from unnecessary and unproductive user contact, programmer turnover also declines.

We do not pretend that all the problems of technical change will be solved overnight through this organizational move. We do feel, though, that the emergence of the CSR is the most promising development to come along in years.

Lawrence H. Cooke Jr. is senior vice-president and product development manager at BayBanks Data Services, Inc., Waltham, Mass.

Cooke has 17 years' experience in data processing. He joined BayBanks in 1979 after five years as manager of systems and programming at Midlantic Bank in New Jersey. He has also held positions with IBM, Computer Applications, Inc. and the Federal Reserve Bank of New York.

Cooke holds the Certificate in Data Processing and earned a B.A. from Boston University and an M.B.A. from New York University.

Joseph P. Campaniello is vice-president for customer services at BayBanks Data Services, Inc. He has nearly 20 years' experience in banking operations at BayBanks and, before that, at Worcester County National Bank, Worcester, Mass.

For more than 10 years, **Campaniello** has championed the cause of customer services within the data processing function and at BayBanks customer services has achieved an equal partnership with programmer/analysts.

Campaniello is a graduate of Clark University and has received executive postgraduate training at MIT's Sloan School of Management.

Attacking Maintenance Costs

By Larry M. Singer

More than half the programming budget in many data processing installations is devoted to "maintenance programming" — that nebulous, hard-to-define activity known as "keeping the system running." One frequently quoted estimate is that by the mid-1980s, this system maintenance function will require 60% to 80% of the available programming talent. Even now it is not unusual for the maintenance of some business application systems to cost a company more in one year than it cost the company to develop the application systems in the first place.

The DP manager may feel helpless in controlling system maintenance costs. After all, isn't the maintenance burden intrinsic to data processing? Even if an application system requires continual, expensive maintenance, isn't it better just to accept reality and pay the price until the system can be rewritten?

The answer is an unqualified "no." Systems and programming maintenance costs can be reduced by a manager who is willing to take a long, hard look at his entire organization and perhaps challenge some traditional DP procedures. A project to reduce system maintenance costs will involve careful planning, thorough research and forceful implementation. In fact, some reorganization of the DP department may be necessary to fully accomplish such a goal.

An additional benefit of reducing system maintenance costs (besides improving the bottom-line P&L) is that the DP manager will probably improve the morale and productivity of his entire programming section. Most programmers and analysts would prefer to work on development projects rather than maintenance, and most DP managers would rather use their programming resources to help satisfy the ever-increasing demands from user groups.

Moreover, shops which have a high

maintenance effort tend to have high rates of costly personnel turnover.

It is essential that the DP manager prepare his professional staff before any planning or research on a project to reduce system and programming maintenance begins. Obviously, the systems and programming staff will be intimately involved in such a project, and its extra efforts will be a determining factor in the success or failure of the project.

Management should stress that any additional demands placed on programmers — such as extra paperwork — will be justified in the end by reducing the maintenance load.

A program to reduce system maintenance costs usually has three separate but overlapping stages:

- (1) Measuring the existing maintenance effort.
- (2) Summarizing and analyzing the maintenance activity.
- (3) Resolving the maintenance problems on a prioritized basis.

Note that such a project is similar to the classical systems analysis procedure by which the DP profession attempts to help various user groups. In this case, however, DPers will be attempting to help themselves and their company by applying the scientific method to help increase their own productivity. This experience should be very educational for all DP professionals who are engaged in systems analysis and design type work.

Measure the Maintenance Effort

The first step in any measurement process is to define the activity to be measured. System maintenance, however, is one of those required activities everyone is sure they dislike, but not exactly sure what it is.

For example, a given task may be classified as "development" when interviewing a prospective analyst but defined as "maintenance" when asking the controller for a larger DP budget. The guiding question should be: Is

this task necessary to keep the application system running in a sound, professional manner?

If the answer is "yes," that task or activity is indeed part of the maintenance effort and is not correctly defined as "development" or "enhancement." Such typical programmer and analyst actions as answering questions

ries and because the existing categories are so vague that they can cover literally everything. If the categories are not properly defined and do not match a shop's typical activities, the programmers may spend more time trying to accurately categorize an activity than the task took in the first place.

Since programmers are more inter-

Most programmers and analysts would prefer to work on development projects rather than maintenance, and most DP managers would rather use their programming resources to satisfy ever-increasing demands from users.

from users, rearranging data on a report, adding badly needed transactions to an update program and making logic fixes are all examples of system maintenance.

Because of the high degree of judgment sometimes involved in separating maintenance from development, the DP manager himself may elect to categorize each activity, or he may appoint one senior-level professional to be the final judge. It is very important that the standards used be consistently and fairly applied in each case.

A time- and project-accounting system is the ideal method to collect the basic data on system maintenance. However, the average time-accounting system (either in-house or purchased as a software package) may have serious deficiencies, either in the way it is structured or in the way it is implemented.

Home-grown time-accounting systems are often of marginal value because they do not have enough categories

in job satisfaction and reward from DP-oriented projects than in "paperwork," they will soon learn to gloss over "paperwork" requirements in favor of more "productive" work.

Some of the typical but sometimes overlooked "maintenance" actions include:

- Answering phone calls and having personal meetings with users.
- Helping the operating staff with production questions.
- Doing the paperwork necessary to keep the system running.
- Tracking down errors in reports.
- Correcting errors and rewriting application system documentation.
- Performing reruns and restarts of production jobs, including after-hours.
- Following up on production problems.
- Running special jobs that are under programmer control.

If the time-accounting system does

(Continued on *In Depth/12*)

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IBM's 4331-2 has an impressive list of features for any system in its performance class. Compatibility with the 4331. Field upgradeability from the 4331. A minimum of 1 million bytes of main storage. Up to 256K bytes of control storage. A list of microcode assists that includes 370 mode and VSE/ECPS. And operating system support that includes DOS, DOS/VS, and DOS/VSE (370 and native mode). That's where the 4331 Group 2 stops. But it's where the M80/31 begins.

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The M80/31 doesn't merely outperform the Group 2, it beats it by at least 15 per cent. The Group 2 gets a 19.6 on International Data Corporation's relative performance index. The M80/31 rates a 23.

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Your M80/31 will never become obsolete. If your application outgrows your Magnuson system, you simply upgrade it. And you do it with a simple board swap in your computer room, because all M80s are field upgradeable. What kind of upgrade is available when your 4331 Group 2 runs out of steam?

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DIFFERENCE

ATTACKING MAINTENANCE COSTS

In Depth/12

IN DEPTH

(Continued from In Depth/9)
not include these activities as "maintenance," it needs to be examined and upgraded before it can be used in any serious study of DP maintenance activity.

Still Problems

Even with a well-designed, comprehensive time- and project-accounting system, the DP manager may find problems. In the average DP environment, the time-accounting system is

the last production job done during a cycle, and the reports usually sit on a desk until someone bothers to file them away.

Members of the professional staff soon discover the lack of importance of time accounting and become careless in monitoring their time.

Not only should time-accounting jobs be treated as production, but the professional staff should be made aware of the new purpose behind the time-accounting system: that data is

not being collected to be ignored, but to be used as part of a serious, ongoing study.

Personal Logs

As a by-product of any good time-accounting system, the participants will be forced to log specific events so they can accurately record their time for the week. These "personal logs" will be just as important as the actual time-accounting summary reports, since any qualitative analysis of the

maintenance effort must focus on the specific activities that caused the effort.

Discovering that a programmer spent 70% of his time on maintenance is one thing, but knowing *what* that 70% consisted of is just as valuable.

The DP manager should insist that his staff utilize a daily personal log to record activities and events. While the format of the log should be standardized (with name, time and activity), the actual contents should be left up to the individual, as long as the log is readable and accurate. This log approach should be implemented along with the time-accounting system.

Again, it is vital that management give the staff some feedback from the logs and the accounting reports, even if it is a simple "I can't read this line." Without feedback, the professional staff will never realize the importance of the study and the entire data collection process.

At this point, DP management may encounter overt resistance from the professional staff, especially as it relates to the extra paperwork and the perception that the study has been triggered by a feeling "that some people aren't doing their jobs." The extra paperwork is indeed a burden on a busy staff, but management should point out that the results of the study will be valuable and worthwhile.

The uneasy feeling caused by any study of professional activity can be alleviated by stressing that maintenance is a widespread problem in most DP shops and that a study of maintenance effort is literally a state-of-the-art project.

An interesting sidelight to the use of personal logs is that management may now be able to estimate the hardware

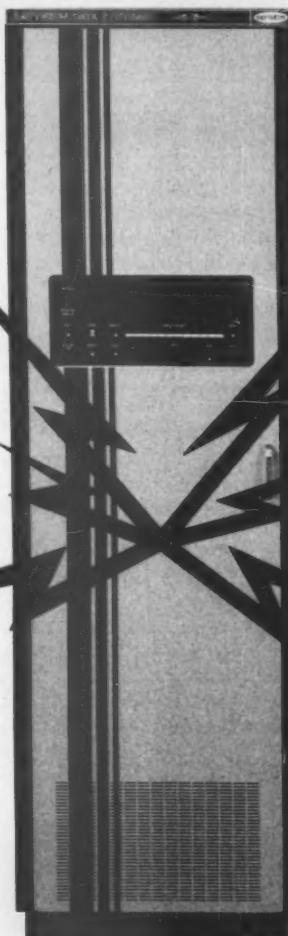
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ATTACKING MAINTENANCE COSTS

IN DEPTH

resources being used in the maintenance effort. Despite what many programmers think, computer time is not free, and some DP managers will be surprised to learn how many resources they have tied up in "maintenance."

Analyze the Maintenance

Once the data collection and personal log procedures are in place, DP management may be tempted to start attacking the apparent causes of the high maintenance effort. This impulse is usually premature, since the true causes of a high maintenance effort may not show up immediately. Rather, long-term study and analysis may be necessary to discover important patterns and trends.

For example, an input error caused by lack of editing in an accounts payable program may cause a high maintenance effort one week, but may actually be a rare incident that happens once every few years. By throwing his limited resources on that one problem, the DP manager may be missing the more expensive and common maintenance problems.

During the data collection process, DP management should have contact with the rank-and-file programming and system staff to explain and encourage the system collection project. But the communication should be both ways — production-minded programmers can provide a wealth of information that will be useful during the summarizing and analysis phase of the project.

For example, if programmer John Jones asks if his unofficial job of helping balance the payroll register every few weeks is a "maintenance task," the DP manager should carefully note such comments. They will help him get a feel for questions that will certainly arise during the analysis phase.

Any study of maintenance effort should also cover those staff members who are not normally thought of as part of the maintenance team, such as first-line managers and systems analysts. If any part of their time is spent in supporting production, their log sheets should be included in the time-accounting and data collection process.

Looking Over the Data

The summarization and analysis phase of the project can begin with two months of raw data. This phase is designed to summarize the quantitative aspects of maintenance (the time-accounting reports) and the qualitative portion (the personal logs).

A summary of time-accounting reports may show that the maintenance effort is cyclical. That is, certain times such as month-end or quarter-end require a higher degree of maintenance hours. This information is valuable in planning development projects where certain staff members have dual development and maintenance responsibilities. In those shops with permanent teams of maintenance programmers, the cyclical trends may show that during certain periods some manpower is actually wasted.

Management should use the quantitative data to determine the correlation, if any, between high maintenance activity and turnover. If the shop does indeed have such a correlation, management can predict which individuals are likely to leave and take preventive measures, such as salary adjustments and rotation of assignments.

The qualitative information contained in the personal logs should be summarized by an experienced project leader or senior programmer who is fa-

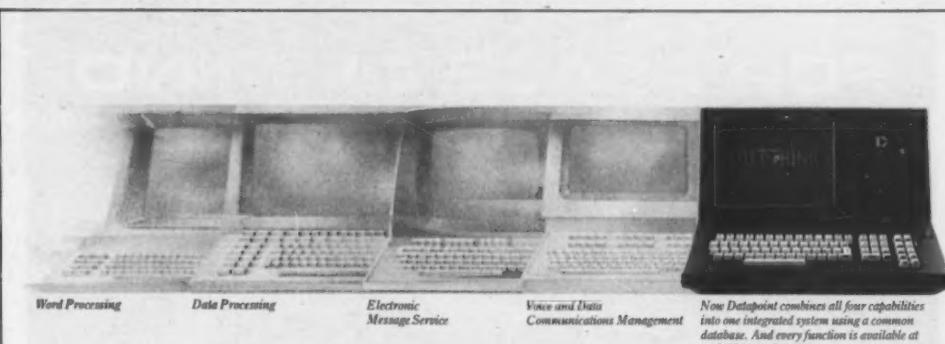
miliar with both the application systems and shop procedures. This summarization needs to have a minimum amount of interpretation and a maximum amount of pattern analysis. In other words, the summarization should show trends that reveal patterns of maintenance activity consistent over the long term.

This pattern analysis might be arranged by application system, such as an accounts receivable system that needs continual updates to the aging

calculations or an inventory system that requires continual programmer intervention to handle specific requests from user groups. Perhaps the summary will be arranged by operational problems, such as incomplete restart instructions that require programmers to become involved in restarts and reruns.

The trend analysis should be performed independently by several individuals, each taking a one- or two-

(Continued on *In Depth/14*)



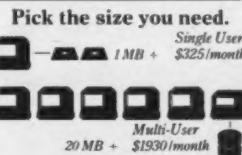
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IN DEPTH

In Depth/14

(Continued from In Depth/13) week period and summarizing the results. Naturally, some analysis of the causes of maintenance effort will be integrated within the summarization — this is unavoidable. However, the final analysis will be performed by management using the separate summaries provided by the senior staff. Allowing different individuals to contribute to the maintenance summarization will assure that no major aspects of maintenance will be missed during the final

analysis, which will cover four to six months of data.

Both the senior staff and management should note that maintenance can always be divided into "unavoidable maintenance" and "avoidable maintenance." Updating state tax tables in a payroll system is required by law, but the process by which that updating takes place can be analyzed for efficiency — there is a significant difference between a procedure that takes 10 minutes and a payroll update pro-

cedure that requires several hours of professional time. Any analysis of the time-accounting and personal logs must carefully note this distinction.

Reducing System Maintenance

After several months of data collection and analysis, management should feel confident that it now has enough facts to begin attacking the true causes of costly system maintenance on a priority basis. The priority list should be determined not only by which problem

leads to the most expensive system maintenance effort, but also by factors such as degree of problem (an incorrect payroll run may be a political disaster for data processing), associated morale problems (a programmer called in to fix the same error week after week may be the next programmer to leave) and availability of resources.

This last factor may be the single most important factor in developing any priority list. For example, if the general ledger system is the single most expensive system from a maintenance view but if the general ledger experts are busy on another project, the maintenance problem will simply have to wait.

There are a number of common system maintenance problems that can affect almost any business DP installation to a degree, but the specific causes of high maintenance are still usually unique to any particular shop.

One expensive area of unnecessary programmer maintenance is in the general category of operational support, usually with reruns, restarts and requests from Operations for help with specific difficulties. Obviously, any application system can and will abend because of bad tapes, disk failures, software errors and operator mistakes, but each jobstream should be documented enough so that members of the Operations staff can handle all common problems themselves. Not only does programmer involvement in the computer room take valuable programmer hours; it can also be a major source of friction between the programmers and operations sections.

Adding restart and rerun documentation to production jobstreams involves substantial resources, but the payback period may take less than a year. Also, such a task can offer an excellent training tool for new programmers or for experienced programmer/analysts who are learning these systems and shop procedures.

Too often, however, operational documentation is useless because there is simply too much. For example, Operations "run sheets" typically contain detailed data set or file information, but not specific, cookbook-style restart instructions that can be followed quickly by an operator or shift supervisor.

Before any major documentation project is undertaken as part of a plan to reduce system maintenance, management should carefully reevaluate the current type and style of documentation.

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IN DEPTH

tation. Good, simplified operational documentation can significantly reduce programming involvement in day-to-day operational problems.

User Support

A second area of usually unnecessary programmer and analyst maintenance effort is in the area of user support. Answering questions regarding reports, data entry, transactions and system usage are all part of a maintenance burden that should be examined.

It may be impossible or politically inadvisable to discourage users from asking questions about application systems, but the DP manager can reduce this burden by verifying that each production system has clear, easy-to-use documentation that explains the system from the user viewpoint. It may be necessary to ask another area of the company for assistance in reviewing written documentation for clarity, such as the sales or advertising division.

Another solution might be to select one professional or paraprofessional to serve as a single production liaison point and free other staff from continual interruptions. It may not be evident from a time-accounting report, but a day interrupted by seven phone calls from various users is a day that has been severely disrupted if the programmer was deeply involved in a task requiring concentrated mental effort.

A third area of programmer activity that affects almost all DP installations is the difficulty in making changes to existing application systems. While adding a new report or new transaction code to a system may be thought of as "development," in many cases such a "development" task turns out to be a maintenance nightmare. Not only is it a difficult, time-consuming project, but errors usually result from these new features that require extensive maintenance effort.

Such "simple" changes can cause severe problems because DP manage-

ment does not control the efficiency of system maintenance changes. In fact, most DP shops perform maintenance changes in an archaic, inefficient manner that would not be tolerated in any other division of the company.

The entire change process can be simplified and made more reliable by realizing that changes to any application system are rarely unique. For example, during the seven-year life of a payroll system, there may be 15 requests to add new data fields to the

payroll master file. Yet in each maintenance (or "development") project, the analyst or programmer usually has to reinvent the wheel by first determining how to accomplish the required change.

The answer is usually a list of 10 or 20 or 30 specific steps written on a scrap coding form. After the maintenance task is complete, the programmer usually discards the list, and the next programmer to update the payroll master file goes through the entire

mental effort again.

Programmers and analysts usually do not retain documentation showing how a particular change was made; rather, they congratulate themselves that they have updated the user documentation correctly. Management should insist that any written documentation developed during a maintenance project be copied for a permanent system file. This requirement alone should save a substantial amount

(Continued on In Depth/16)

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IN DEPTH

In Depth/16

(Continued from In Depth/15)
of time in future maintenance changes. Furthermore, with specific steps documented, the programmer and analyst will be better able to ensure the correctness of the change, which should result in fewer maintenance problems after the change is installed.

Production Changes

A fourth area of high maintenance that is often overlooked is the question of continuous changes to production

systems. The DP manager should examine the time-accounting and personal log summaries for instances when programmers had to recompile and relink production programs.

Since production systems should be generally static, he must ask why the programming staff needs to make continual changes to keep the system running.

Are the changes designed to bypass batches of data that were input by mistake? A control card and some simple

bypass logic would accomplish the same result with much less programmer effort and time. Do the programs need to be modified to trigger certain reports and options that are not user-controlled? Perhaps the system needs a new transaction code or method for the user to select and trigger reports he needs himself.

The Question of Control

The DP manager may wonder if he can go too far in giving up control over

certain application systems. Some analysts and DP professionals adhere to the seldom-stated but often-followed theory that certain application systems need DP staff control and that the users cannot always be trusted to handle critical aspects of production systems. They might argue that certain options and updating should be controlled by a programmer familiar with the system and its internal processing.

'Contrary to DP beliefs, users can be trusted with their application systems if they are given proper documentation and training.'

Such an argument ignores the real world of data processing. While a system is being developed, it is true that the programmers and analysts know the system better than any user group and would prefer to trigger critical system action themselves. After all, the system is still relatively new, and the technical people are anxious to help bring the system into full production status.

But the programmer who wrote that critical update process will eventually leave, to be replaced by a programmer who lacks not only the detailed knowledge of that particular system but also the desire to trigger a weekly update or critical report run. The new programmer treats that requirement as a maintenance burden. The original reason for preserving data processing control over that production applications systems no longer exists, and the DP staff is stuck with one more maintenance burden for the next 10 years.

A general policy should be to transfer as much system control to the user group as is practical and safe. Ideally, the user management should "control" the system without DP professional staff assistance or involvement. Contrary to some data processing beliefs, users can be trusted with their application systems if they are given the proper documentation and training.

By examining systems which do require continual programmer intervention, the DP manager can develop a plan to transfer control over the system operation from his programmers to the user groups where it belongs and correct a mistake made long ago when the system was first developed.

By following a plan to study and evaluate system maintenance activity, then, a DP manager can control and reduce his system maintenance costs. However, such a program does require hard data, such as time-accounting reports and summaries of personal logs. It is usually not wise to accept the opinions of professional staff who feel they "know" how to solve the maintenance burden, since they tend to see matters from their own personal viewpoint.

Larry M. Singer is a project leader at Informatics, Inc. in Columbus, Ohio. He holds B.A. and M.A. degrees from the University of Akron.

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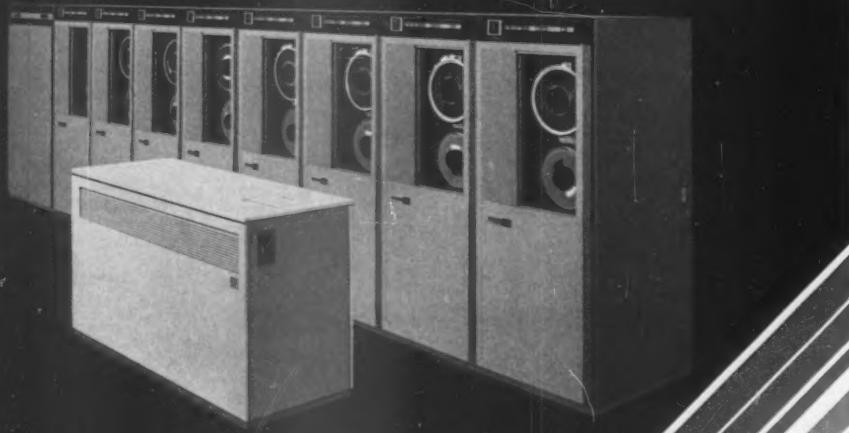
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DP and Security Just Aren't Talking!

By Dennis F. Poindexter

Burgeoning interest in DP security has come about, in part as a result of the proliferation of stories, some sensationalized, dealing with computer-assisted crime and the misuse of computer equipment.

This interest has been heightened by an increasing awareness by management of the vulnerabilities of computer-stored data, by the issues of privacy and by the increasing value of goods reduced to transferable forms.

The result: Many firms have sought to increase the protection of their computer systems. As this emphasis has increased, the security professional has been hard-pressed to keep pace with an ever-changing, technically complicated environment.

A common method of upgrading security has been to introduce DP professionals to the security staffs or assign technical specialists to augment inspection programs and auditing. This requires cooperation between two fields, security and data processing, that coexist at degrees ranging from mutual assistance to diametrical opposition. The difference in the level and intensity of cooperation is often the intuitive understanding of difficulties in communication between fields that have only recently found themselves working together.

Oversimplified Explanation

A ready and familiar explanation for communication problems between security and DP professionals is the differences in language. However, this is a totally oversimplified and misleading factor. Although it does play a part in reducing the time necessary to develop understanding, there are fundamental differences between these two groups that are more significant and divisive than language alone.

Traditionally, DP has relied on a widespread ignorance of its functions as a built-in protective device. During the field's early stages of development this was a logical and practical ap-

proach, since there were few computers and very few people who knew the secrets of the inner workings of the machines.

While this is no longer a recognized security measure, a number of computer professionals began their training and gained their experience in an environment where security was by exception. Many of these persons are today's systems supervisors and managers. The less flexible among them still accept and expect that ignorance of their system will protect it. There is enough truth to this belief that unless — or until — the vulnerability is demonstrated by an abuse or some other event, it will persist.

The degree to which people specialize in various branches of the computer field has contributed to the belief that ignorance remains a protection. It is now almost impossible to be a computer expert. There are a myriad of distinct hardware and software areas which for simplicity, and often for protection of proprietary business interests, are intentionally protected. The usual "Help Wanted" ads of any newspaper will attest to the demand for a variety of exclusive skills.

In this environment, it becomes increasingly difficult to be a generalist except in one of the generalized areas. There is, of course, a great deal of necessary overlap between these areas, but it is a paradox that such specialization produces its own ignorance. As a result, there is a need for an increasing number of DP specialists to assist in security.

Best Approach?

In many businesses, security and data processing are mutually exclusive. Even some of the largest corporations have established computer security sections which are made up solely of DP persons. The decision to assign these persons to security is an expeditious approach. Unfortunately, it may not be the best.

In the discussion that follows, it should be clear that there are differences in the orientation of security and DP persons and that these differences slant the view each has of his work. By limiting security sections to computer personnel, management may unknowingly cause restriction in the scope and understanding of computer security

new associates. However, the difficulties in communication between security and DP people are much more complicated than the meaning of terms. I once learned this when a DP professional, in response to a question on the impact of the addition of a particular type of hardware, said: "The answer to your question is easy

There are fundamental differences between these two groups that are more significant and more divisive than language alone.

problems.

Even in facilities where the security department is not responsible for data security, consultation and coordination between the two functions is common. The quality of this cooperation is affected by the ability of persons in each field to relate to the other.

The importance of this communication cannot be overlooked. The technical knowledge of persons outside the facility is growing. Today, with high school sophomores writing programs and building hardware, the number of technically qualified potential abusers is increasing dramatically. Computer security, as a consequence, is an urgent concern and preventive measures require cooperation between security and DP.

The question then becomes how to express security problems to data processing persons and how they, in turn, should express the technical issues impacting on security.

The language barrier is only part of this problem. We all tend to use terms common to our field. We all expect a certain amount of adjustment in learning the language of a new office or

enough, but I wonder why you asked it."

This represents a fundamental difference in orientation. It is caused, in part, by previous experience with security measures, but to a greater extent, by the differences in levels of abstraction in these fields. This is not a matter of knowledge or language, but of the focus of both.

Hiyakawa¹ described levels of abstraction using the example of a cow. At one level, the animal is molecules and atoms, then flesh, skin and bone, then an object, labeled "Bessie"; then a Holstein; then a cow and so forth. Persons speaking about Bessie are going to lose the message, or part of it, when they operate at different levels.

Level of Abstraction

With a complex field like data processing, one is tempted to say that the computer specialist operates at a higher level of abstraction than the security specialist, but this issue is far more complicated.

The diversification of computer technology has meant a high level of ab-

*(Continued on *In Depth*/18)*

DP AND SECURITY NOT TALKING

IN DEPTH

resolved. Each viewpoint tends to have its own momentum which continues to divide the fields. In interpersonal communication there is a well established principle of "set" which, in this instance, works against cooperation.

In this instance, there are two fields with different experience upon which decisions are made. The experience creates expectations about an anticipated event, and inputs from a source which do not fit these expectations are likely to be ignored.¹ This has serious implications for security. Security systems are many times cued to particular events which indicate an unusual occurrence and may be a key to an attempted system penetration. Ignoring these keys will increase the number of attempts at entry to a system and give a greater chance of success. A simple example will illustrate this point.

Typical Situation

In most systems, some type of file protects are used to restrict access. Passwords are a common means of limiting this access. In theory, every person should be able to enter a password on one attempt, but practicality allows for more than one. After this number, software features can be used to lock out the originating terminal, or in the more sophisticated systems, the terminal is identified to the operator console and kept on line so that its activity can be monitored.

The trouble with any such system (and most mechanical/electrical entry systems) is that it usually works. Every time the passwords are changed, that well-known "10% who never get the word" start showing up, operators are busy with jobs, hardware goes down and software doesn't always work as it should. These are typical everyday problems.

There is an unfortunate inclination to believe in the familiar. The terminal on the fourth floor locks out. Dave calls to say he is locked out and needs to get data for Jim up in Production. The corporate procedure calls for an investigation, but this is the second time today and . . . the software probably isn't right. Maybe all the changes weren't made. To an experienced security officer, this is all too familiar.

In computer systems, the problem is aggravated by continuous system failures of all types. If everything worked properly, we would set up a computer

system and never have to worry about it, but it seldom does. The anomaly is common and frequent. Operators are attuned to these occurrences and make the "obvious" assumptions about the cause.

The difference between a very good security patrolman and the average is often that the good one notices something out of the ordinary and has the patience to follow through in an investigation. If the computer operator did the same, that person might well be

working elsewhere in a week or two.

The three major areas of discussion — level of abstraction, orientation and the momentum of sets — are the elements of an environment not conducive to high levels of cooperation. If recognition were a panacea to resolving all differences, it would be sufficient to state fundamental differences and let intuitive understanding lead to cooperation. But in practice, recognition is not enough.

Some believe there is a choice be-

tween making a computer security specialist from a computer expert or a security specialist. The comment is generally made that it is easier to make a computer security effort by using DP-experienced persons. These comments are voiced by persons with a computer background.

But there are enough conceptual differences in the two fields that there is a need for both. They each have something to bring to the other. Because of

(Continued on *In Depth/20*)

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DP AND SECURITY NOT TALKING

IN DEPTH

In Depth/20

(Continued from In Depth/19)
the technical complications of the computer field, it becomes difficult, if not impossible, for a single person to be a computer security expert. It becomes more and more important to develop a team approach to bring the backgrounds of both to work.

Donn Parker once described the areas required in an audit to achieve a satisfactory result. Although the auditing function is a limited portion of total computer security, the problem remains. Parker said: "The areas of specialty include physical security, operational security including recovery and backup application analysis and programming, systems programming and electronic engineering. This implies a team approach to auditing to achieve the necessary depth of expertise in these diverse areas."

Another related publication of the Rand Corp. stated: "The security problem of specific computer systems must be solved on a case-by-case basis employing the best judgment of a team consisting of systems programmers; technical, hardware and communications specialists; and security experts."

Unfortunately, no single person can be responsible for all computer security. Even agreeing that more than one person is necessary and bringing both security and data processing together is not enough.

A natural tendency between differing groups is for them to become defensive about their respective positions. During the development of policy there is little room for provincialism and egalitarian responses. These may be partly the result of an understood difference in status of the participants.

The computer mystique has its re-

wards, for all its difficulties. It is not easy to compensate for the high regard that computer specialists have; security, except in rare instances, has operated with less money, emphasis and status. Where the high-stakes corporate interests are at issue, cooperation on an equal basis is essential. There must be recognition that policy will be made through a variety of inputs which may be logically considered.

This requires a belief in the worth of persons who have to work together. The person or office which is to direct computer security must ensure that the corporate interests are placed above whatever differences in policy develop. Initially this may be easy enough, but over a period of months impingements on efficiency take a quick toll on DP and the technical details of computer systems can slow the best security professional. It is easier to compromise the computer security program than to face the fact that there are acknowledged differences that take time and frank discussions to resolve.

Management's Duty

Management's responsibility in resolving differences is to define what level of restraint is acceptable and what information is to be protected. One might believe that this is a necessary first step, but "agreeing to agree" is a satisfactory beginning.

Defining the level of restraint is a complex problem in which decisions must be made on the nature of the threat to the data base. Security has resources to develop many of the known threats and the general types of corporate information being protected. Data processing can relate this information to what is on the computer system and make realistic inputs on the types of

threats most easily carried out.

The second facet of this is to decide what information is most important and deserving of the greatest protection. In data processing, management may neglect to designate what information is to be backed up, leaving this decision to the systems managers. It may not occur to them that what is essential to restoring the computer system may not be the same information necessary to restore the business. In the same way, protecting everything at the same level is protecting the most important information at the same level as the least important. Just as there are limits on the backup capability, there are limits on how much can be protected.

Once these matters are resolved, the technical nature of the discussions will become more apparent.

Most Prevalent Problems

In this, the problems of abstraction, orientation and set are most prevalent. Here too is the legitimate problem of language — linguistics and abstraction. By sheer weight of volume, the burden largely falls to security, but it is equally important for the data processing professional to realize that "computer security" is two words. Security has its own set of terms not easily understood and there is an equal responsibility to discuss them.

Although there are arguments to the contrary, considering the state of the art, computers are not very secure. Demonstrations by the somewhat obscure tiger teams have shown that a number of techniques, both simple and sophisticated, make it possible to extract data from a system without authorization.

In security, it is generally preferable

to prevent crime, but if that fails, to detect it. Computer security has changed the latter goal. The careful theft of data is much like the "theft" of important papers by photographing them and returning them to their rightful place. There is no evidence of a loss and no cause for concern. The problem, then, is to make this as difficult as possible. We are getting better at this — but only through extensive cooperation between people who are conceptually attuned to both security and data processing.

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The views expressed in this article are those of the author and do not necessarily reflect those of the DLA.

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Is DDP Right for You? — Part 1

Determine Need for On-Line Processing

By Lawrence C. Hartge Jr.

Special to CW

Much has been said about the benefits of distributed data processing (DDP). Defined as a system in which a group of computers and communication lines dynamically share data and processing, DDP can combine the central control and economies of scale of centralized processing with the system tailorability and timely access to data of decentralized systems.

However, because DDP is a broad and flexible concept, it is often difficult to determine its real value — if any — for your own particular environment.

If you are considering a move to DDP, there are five criteria that will help to determine whether DDP is right for you. If more than one of these criteria is applicable to you, DDP deserves a closer look.

These criteria are the need for interactive processing, the 80/20 work load, the need for local accountability, organizational structure with dispersed functions and rapid

company growth.

If you have no need for on-line processing, then DDP is not for you. If you do need an interactive system, however, DDP can often be much more cost-effective than a central-

DDP can hardly be called a new concept, but the controversy over centralization vs. decentralization is still going on. This two-part series provides five criteria for determining whether DDP is right for your organization.

ized system.

The underlying principle of distributed processing is that processing power should be placed where it is needed most or where the job can be performed most effectively. It frequently makes much better business sense to have local data storage which can be

directly accessed and updated and to send summary information to headquarters on a "need-to-know" basis than to use expensive communication links to stay on-line to a centralized system.

Moreover, if you need fast response time yet have a large terminal population or heavy data traffic, then a distributed system may be essential. Otherwise the central computer could easily be overloaded and overall processing speed reduced.

If it is crucial that your on-line system provide uninterrupted service, then you will definitely be a candidate for DDP. Having most of the processing power distributed where it is needed is a safeguard against the communications outages possible with a centralized on-line system.

Thus a company with distributed systems in its sales offices, for example, can continue to take orders from customers even if phone lines to the mainframe are down. And if a local processor itself goes down instead of the phone lines, processing power is not lost as it would be with a centralized system, since the other processors in the network can be used as backup.

Local/Remote Ratio

If on-line interactive processing is required, this second criterion for DDP will probably also be applicable. Under this rule, DDP makes economic sense when 80% of the processing is done locally and 20% remotely.

In this situation, distributed processing will usually be much more efficient than centralized processing. Data transmission costs can be significantly reduced, since only summary data is passed to the central computer.

The slow response time of the central computer.

(Continued on Page 62)

HP Graphics Input Tablet Allows Drawing on CRT Screen

PALO ALTO, Calif. — A graphics input tablet suitable for drawing on a CRT screen, tracing graphics documents or picking from a menu has been introduced by Hewlett-Packard Co.

The HP9111A features user-definable softkeys, ceramic platen, lightweight stylus and programmable data rate. It was designed



The HP9111A

for applications in interactive graphics, graphics entry and menu selection.

Interfaced through HP-IB, HP's implementation of IEEE Standard 488-1978, the tablet is compatible with a wide variety of HP computers, including the HP-85 personal computer, the 9800 series of desktop computers and the HP family of technical minicomputers, the vendor claimed.

The HP9111A is priced at \$1,950 from HP at 1501 Page Mill Road, Palo Alto, Calif. 94304.

CDC, HP CPUs Run Calcomp Plotters

ANAHEIM, Calif. — California Computer Products, Inc. has released two plotter control interfaces that reportedly permit Hewlett-Packard Co. 3000 and Control Data Corp. Cyber 18 CPUs to use most Calcomp plotters.

The interfaces are single-printed circuit cards that mount in Calcomp's 907 on-line controller.

The interfaces give HP 3000 and Cyber 18 users access to drum and beltbed plotters that offer plot widths from 11 to 72 in. and plotting speeds up to 30 in./sec, the vendor said.

The HP 3000 interface costs \$5,740 and the Cyber 18 interface costs \$6,140, the vendor said from 2411 W. LaPalma Ave., Anaheim, Calif. 92801.

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The Beall Channel Switch. Prevents computer traffic jams by directing critical on-line services to another CPU when failure occurs. Allows specific peripherals to serve more than one computer. Redrives all CPU signals to give you far more flexibility for physical placement of peripherals.

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SYSTEMS & PERIPHERALS

Look Again at DDP if On-Line System Needed

(Continued from Page 61)
 puter, flooded by data from every division or department, will be replaced by instant interactive access to the local data base.

Local management decisions will be based on timely and accurate information, and top management will still receive the integrated summary data it needs. With a capable network, headquarters can remotely access data without local operator intervention.

'Hardware is not the only system resource easily shared in a distributed system. Program development personnel can be centrally located.'

In general, the 80/20 rule means that one should distribute the processing power to where the work is done or the results are needed.

Economics of Scale

But what about so-called economies of scale?

When applying the 80/20 rule and implementing DDP, can one achieve the same economies of scale that seem to be evident with a centralized system — the savings in hardware, program development and maintenance of software and hardware?

The answer — to a great degree — is yes, because DDP allows the sharing of many system resources. Processors themselves can be shared, so that an application program can be processed on the hardware best suited to it.

For example, scientific data can be analyzed most efficiently on a system with a scientific instruction set and a floating-point processor. But the processors used for gathering the data need not have these capabilities.

It is only necessary to transmit the data to the scientific system for processing, thus lowering total costs while making greater capabilities available to each site.

The same principle applies to the sharing of expensive peripherals, such as high-speed printers, plotters, large disk drives and magnetic tape units.

While it is true that DDP requires more processors than a centralized system, these processors are generally smaller and less expensive. In addition, hardware costs are dropping so rapidly that by 1985 they are projected to be only 10% to 20% of the typical DP budget.

Shared Resources

Hardware is not the only system resource easily shared in a distributed system. Program development personnel can be centrally located and

yet develop programs for use at many sites.

New software is transmitted through the network to the computer that will be using it. In the same way, software needing to be debugged can be transmitted to a software engineering group at one location.

In effect, those program development and software engineering people are "shared" through the results of their work: application programs.

In addition to sharing application software, even hybrid software — consisting of software and firmware — that cannot be copied may be shared. If this software is an advanced compiler, for example, all programs in that language can be compiled on one system, and the compiled program transmitted back to the system on which it will be run. Thus, an extensive sharing of system resources is made

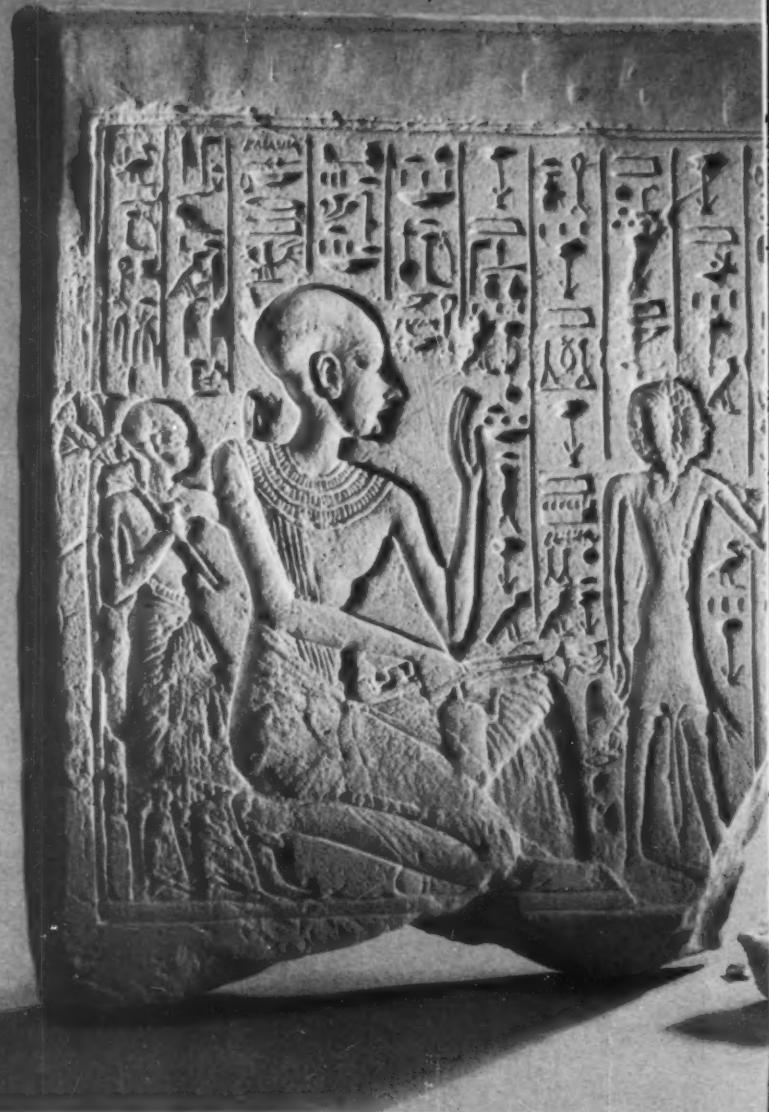
possible by the communications network connecting the processing nodes in a distributed system.

Another major benefit of applying the 80/20 rule in a DDP environment is that projects can be managed much more effectively. The magnitude of the applications running on DDP systems is considerably smaller than applications running on a centralized mainframe.

Smaller, more manageable projects tend to be completed in a more timely fashion without associated cost overruns.

The remaining three criteria — local accountability, organizational structure with dispersed functions, rapid company growth — which should be assessed in DDP decision making will be explored next week by Hartz, who is with the General Systems Division of Hewlett-Packard Co.

Are you about to buy a space age On-line system with a stone age printer?



Dema Spotlights Productivity

ORLANDO, Fla. — "Improving Productivity and the Quality of Working Life for Data Entry" will be the theme of the Fourth Annual Data Entry Management Association (Dema) Conference to be held here Nov. 10-13.

Fifty sessions will cover such subjects as distributed data entry, the office of the future, alternatives to traditional data entry, management and communications and equipment evaluation.

Addressing productivity from the industry's point of view will be Ryal Poppa, president and chief executive officer of Per-

tec Computer Corp. Also scheduled to speak are Donald Brosnan, president of MSI Data Corp., Gary E. Liebl, president of Microdata International, and Raymond Kurzweil, president of Kurzweil Computer Products.

Equipment exhibitors will include IBM, Univac, Advanced Systems, Computer Devices, Consolidated Computer and Inforex.

Individual fees for the conference are \$300 for Dema members and \$345 for nonmembers; team fees (three or more) are \$270 per Dema member and \$315 per nonmember. Dema can be reached through P.O. Box 3231, Stamford, Conn. 06905.

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Plessey Disk Subsystems Emulate DEC's RP11-C

IRVINE, Calif. — Plessey Peripheral Systems has introduced an array of computer subsystems that emulate Digital Equipment Corp.'s RP11-C and utilize Plessey's PM-DC1100 controller.

The subsystems provide compatibility with the line of system software for RP series expansion and the controller features transparent EEC and multiword transfers.

It can be cabled directly to one or two drives; with a multidrive interface chassis, the controller can support up to eight drives.

Combined Controllers

When the PM-DC1100 is combined with the PM-FD11/G Winchester disk drive, it becomes the PM-FS11/G Winchester disk subsystem.

Using a multidrive interface chassis, a single PM-DC1100 controller supports up to eight 25.3M-byte drives over 200M bytes of data storage utilizing the Winchester technology, the vendor claimed.

The PM-FS11/G Winchester Disk subsystem is available for \$7,442.

Plessey is located at 17466 Daimler Ave., Irvine, Calif. 92714.

Free Brochure Treats Recovery, Disaster Backup

WAYNE, Pa. — A free brochure written to help DP professionals in large computer-dependent organizations evaluate disaster recovery backup options is available from Sun Information Services Co.

Entitled "When Management Asks about Computer Disaster Backup and Recovery. What will You Tell Them?" the 10-page publication uses a question-and-answer format to review possible risks and complications to computer operations in emergency situations.

The brochure is available from Sun, 656 E. Swedesford Road, Wayne, Pa. 19087.

ICE, Inc. Supplies Printer Service

ELMHURST, Ill. — ICE, Inc. has announced the establishment of two national maintenance services for Printronix, Inc. and Data Printers Corp.

The firm will handle maintenance for the full line of Printronix printers and the data printers' Chaintrain line.

A full service maintenance contract for either company can be obtained from ICE at 772 N. Church Road, Elmhurst, Ill. 60126.

Template Offered

SAN LEANDRO, Calif. — Levitt Products Co. is offering an overlay template designed for software, drafting or graphics DP personnel.

The templates are available in 10 char./in. by 8- or 6-line/in. and cost from \$34 for large versions and \$21 for smaller templates.

The vendor can be reached at P.O. Box 4308, San Leandro, Calif. 94579.

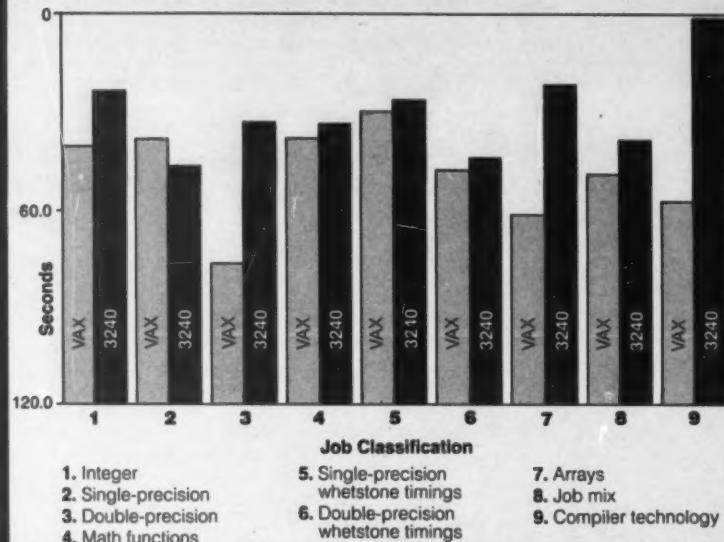
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PMS0254	4.710	4.485	1.05
PMS0354	9.160	8.990	1.02
PMS0454	43.610	43.451	1.00
PMS0554	86.420	86.123	1.00
PMS0664	1.610	1.350	1.19
PMS0764	7.040	6.679	1.05
PMS0864	13.730	13.370	1.03
PMS0964	66.830	66.068	1.01
PMS1064	132.920	129.727	1.02
PMS1124	1.520	1.306	1.16
PMS1234	2.470	2.424	1.02
PMS1324	1.310	1.618	0.81
PMS1407	251.560	37.327	6.74
PMS1507	50.260	57.657	0.87
PMS1674	22.440	23.005	0.98
PMS1724	52.550	53.133	0.99
PMS1807	50.180	34.766	1.44
PMS1907	32.020	34.679	0.92
PMS2007	17.720	20.264	0.87
PMS2107	13.450	20.242	0.66
PMS2202	33.311	26.352	1.26
PMS2324	121.610	137.997	0.88
PMS2402	0.940	0.539	1.74
PMS2502	0.720	0.562	1.28
PMS2624	122.920	227.689	0.54
PMS2708	4.850	0.961	5.05
PMS2809	103.770	0.006	17295.00
PMS2934	0.660	0.414	1.59
PMS3009	0.230	0.006	38.33
PMS3103	0.610	0.398	1.53
PMS3202	4.740	3.923	1.21
PMS3307	2.470	1.959	1.26
PMS3407	39.190	7.774	5.04
PMS3507	5.580	2.587	2.16
PMS3607	156.540	20.077	7.80
PMS3701	4.480	1.621	2.76
PMS3802	4.060	2.874	1.41
PMS3903	6.050	3.864	1.57
PMS4002	9.330	5.505	1.69
PMS4102	76.290	77.764	0.98
PMS4202	118.490	125.039	0.95
PMS4301	110.650	75.569	1.46
PMS4403	1.990	0.739	2.69
PMS4584	219.990	189.081	1.16
PMS4603	18.640	16.939	1.10
PMS4701	0.350	0.077	4.55
PMS4802	0.830	0.880	0.94
PMS4934	0.340	0.050	6.80
PMS5008	0.430	0.168	2.56
PMS5108	98.950	55.419	1.79
PMS5208	0.900	0.917	0.98
PMS5308	0.330	0.029	11.38
PMS5408	2.080	1.697	1.23
PMS5502	1.130	2.180	0.52
PMS5602	207.140	198.685	1.04
PMS5703	585.170	254.545	2.30
PMS5824	18.740	18.194	1.03

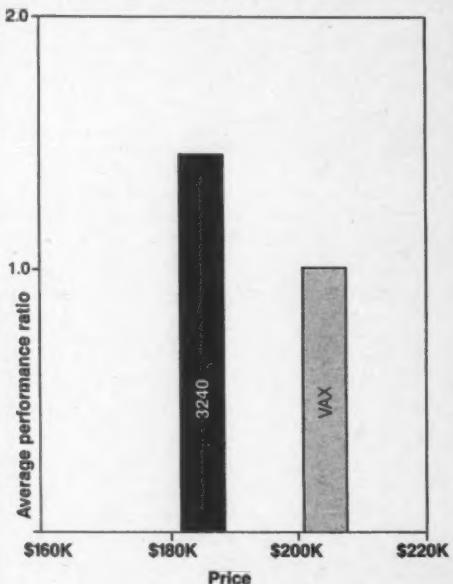
*Performance Ratio = $\frac{\text{VAX 11/780 CPU time}}{\text{Perkin-Elmer 3240 CPU time}}$

2. Perkin-Elmer 3240 vs. VAX* Average Time by Job Classification



*VAX is a trademark of Digital Equipment Corporation.

3. Proven Price/Performance



The configurations tested were 2 MB of memory, 67 MB disc, 75 ips tape, Floating Point Processor, CRT terminal, battery backup, and system software. The 3240 had a Writeable Control Store and Fortran Enhancement Package, while the VAX 11/780 had a Floating Point Accelerator.

The Perkin-Elmer 3240 is Faster than VAX.

Our 32-bit Model 3240 performed 44 out of 58 benchmark tasks faster than the more expensive VAX 11/780.

We matched our Model 3240 against the VAX 11/780 in 58 customer supplied benchmarks, comprising 697 million FORTRAN statements.

In 44 of the benchmarks, the 3240 performed *faster* than VAX.

Overall, the 3240 delivered an average 1.4 times higher performance.

Yet the 3240 configuration costs approximately \$20,000 less than its corresponding VAX configuration.

All 58 FORTRAN benchmarks listed in Table 1 were submitted by our customers and prospects reflecting their application needs. Applications that deal with the same kind of problems you face every day.

All benchmarks were run on-site at various locations across the country. And all were run by vendor-trained operators.

In Table 2, we organized the benchmark results into nine common types of job classification, so you can see at a glance how the 3240 stacks up vs. VAX 11/780. (The ninth classification demonstrates the superiority of Perkin-Elmer's system software, in this case globally optimizing FORTRAN VII.)

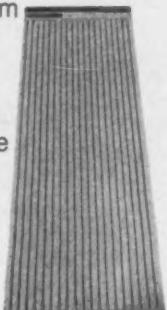
As shown in Table 3, the story is simple and uncomplicated. The

Perkin-Elmer 3240 outperforms VAX 11/780. And it costs less.

The 3240 is faster than VAX in another important way—we can deliver it faster.

We'd be happy to send you a sub-set of those benchmarks which are non-proprietary or have been released with permission, so you can run them yourself. We'll also send you hardware and software documentation.

Before you make a decision on any supermini system, get all the facts on the new 3240 from Perkin-Elmer.



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PERKIN-ELMER

Sprint 5 Gets Feeder, Stacker

SAN JOSE, Calif. — A cut paper feeder and stacker for Qume Corp.'s Sprint 5 terminal has been announced by the firm.

Designed with new electronics and the same mechanical structures as the Qume Speedfeed, the Speedfeed 5 is a single hopper feeder that automatically stores, inserts, ejects and stacks up to 220 sheets of paper in a variety of sizes, the firm said.

Installation of the Speedfeed 5 may require upgrading of some systems by a Qume service dealer. The feeder and stacker costs \$1,000 with 30-day delivery from Qume at 2350 Qume Drive, P.O. Box 50039, San Jose, Calif. 95150.

Color Graphics Printer Has Built-In Auxiliary Computer

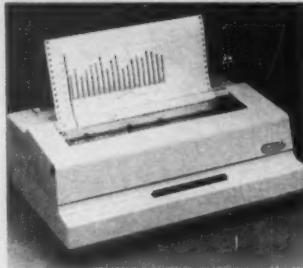
NORCROSS, Ga. — Printacolor Corp. has unveiled an intelligent color graphics printer terminal with an auxiliary computer enclosed within it.

The Printacolor IS8001 consists of a three-color ink-jet print head capable of giving graphics output. The internal computer enables it to interface with the host computer and limits dependency on the host, the vendor claimed.

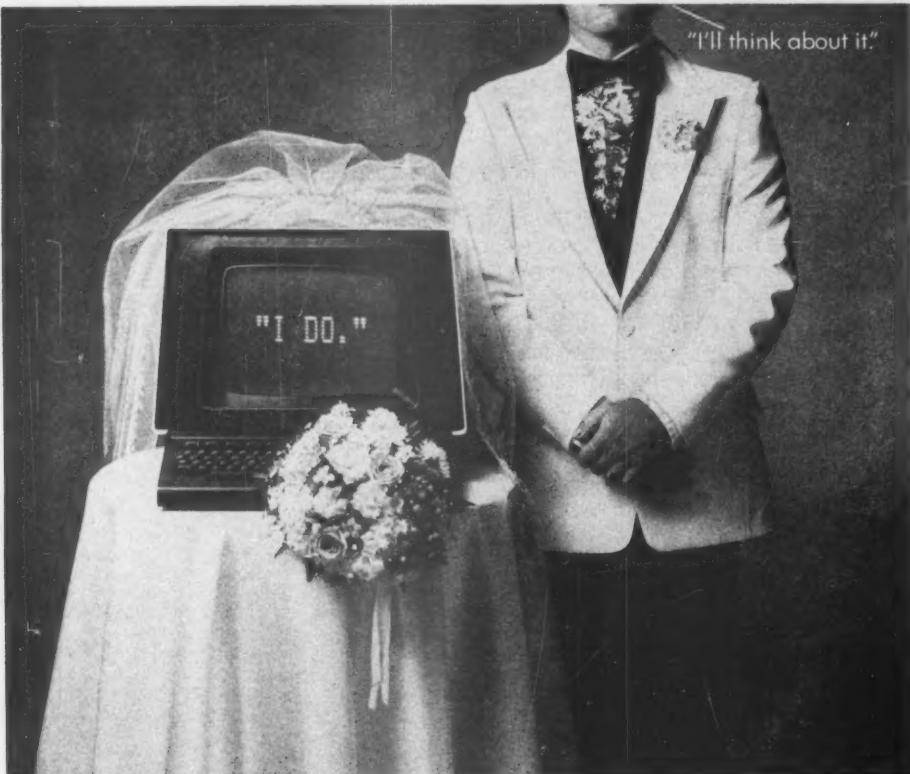
The terminal has a 14-7/8-in. paper system with 70-char. capability and the printing head has 12 ink nozzles which print any of seven colors, by the overlay of three color inks.

Each of the three ink color jets has four nozzles.

The price for the product is \$6,000, the vendor said from 5965 Peachtree Corners E., Norcross, Ga. 30071.



The Printacolor IS8001



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All we ask is that you treat our terminals with respect, honor our standard purchase agreement terms, and take responsibility for freight charges.

But obviously we aren't worried about unrequited love. We wouldn't commit to the best guarantee in the business if we couldn't put you together with the best terminals in the business, from our teletype-compatible models to our interface-compatible models.

And to make our togetherness even cozier, we've coupled our 90 day guarantee to our standard 6-month warranty. Nobody can offer you a bond as strong as that, for love or money.

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Paperless Device Produces Braille From Cassettes

STUART, Fla. — A paperless device which reportedly produces braille from magnetic cassettes, computers and other information sources is available from Triformation Systems, Inc.

The Digicassette can be used as a notebook, audio recorder, calculator and word processor, the vendor said. It is equipped with high-speed search that permits the operator to call back lines of braille.

The seven-key keyboard includes six braille keys and one space key and is used to write braille. The heart of the system is the braille display with 20 braille char./line, each made of six dots which protrude silently.

The shape and size of the characters are identical to those of braille books. The price for the device is \$4,350, the vendor said from 3132 S.E. Jay St., Stuart, Fla. 33494.

Career Courses Set for Fall

NORRISTOWN, Pa. — A career development program for executives, managers and information processing professionals was announced by William Maxwell, president of Maxwell Institute, Inc. Designed to provide advanced educational training with a minimum of time and expense, the course runs for six three-hour evening sessions.

The Delaware Valley-based training center also offers courses on data base concepts, management of application development, selection and implementation of a business minicomputer system, legal contracting with hardware companies, development of a DP auditing function and computer system fundamentals.

The cost of the Maxwell programs is \$150 each. Further information can be obtained by contacting Bill Valinote at Maxwell Institute, 2860 DeKalb Pike, Northtowne Plaza Shopping Center, Norristown, Pa. 19401.

Federal Meet Features Ex-U.S. Navy Admiral

WASHINGTON, D.C. — Former U.S. Navy Rear Admiral Rowland Freeman III, administrator of the General Services Administration, will be the featured speaker at the Federal Computer Conference here on Sept. 22-24.

The conference was designed to help Federal Government ADP managers solve their productivity problems and give them an in-depth understanding of recent advances in information processing.

Oriented specifically toward ADP's role in making the Federal Government more efficient and accountable, the conference is expected to attract more than 9,000 attendees.

More than 80 speakers from both public and private sectors will take part. The latest in computers, peripherals, accessories, software and services will be on display.

Additional information is available from the Federal Computer Conference, P.O. Box 368, Wayland, Mass. 01778.



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INNOVATION

Offerings Based On DEC Hardware

• LSI-11/23-Based System Takes Floppy, Hard Disks

MOUNTAIN VIEW, Calif. — Scientific Micro Systems, Inc. has introduced a system compatible with the Digital Equipment Corp. LSI-11/23 that supports both floppy disk storage and Winchester disk technology.

The Disk System 11X features an LSI-11/23 MPU, 128K bytes of random-access memory, four RS-232C serial ports and up to 2M bytes of floppy disk storage in a single enclosure. Storage can be expanded by adding a 26.4M-byte Winchester drive.

The 11X system is compatible with standard DEC RT-11 and RSX-11M operating systems. The addition of dual-head floppies reportedly doubles the storage normally available when running the RT-11 operating system offered on DEC's RX02 floppy diskettes. The device is also said to have a 40% faster disk access compared to DEC's single-head floppy drives.

Two Modes

The disk system contains a proprietary controller to interface between the LSI-11 Q-Bus and both floppy and Winchester-type drives. Two modes of operation are (Continued on Page 68)

• PDP-11/23 Offering Features RSTS/E, QDMS

HARTFORD, Conn. — Two Digital Equipment Corp. PDP-11/23 configured systems which feature RSTS/E time-sharing software and include the QDMS Data Management System have been introduced by Quodata Corp.

Composed exclusively of DEC hardware, the Q610 and Q620 also feature local DEC field service maintenance contracts.

Aimed at smaller users or a department within a larger company needing a time-sharing system, the basic configuration consists of DEC's PDP-11/23 CPU, 192K bytes of MOS memory, a four port multiplexer and two removable disk drives all mounted in a 40-in. high cabinet. In addition each system includes a VT100 CRT terminal, the RSTS/E operating system with Basic-plus, QDMS Data Management System and complete installation by DEC.

The RSTS/E supports concurrent, interactive and batch processing, Basic-plus, Basic-plus II, Cobol, Fortran, Pascal, APL, RPG-II, PL/I and assembler languages. It can run on PDP-11/34, 11/44, 11/60 and 11/70 computers with as many as 63 independent user jobs and connections to 127 terminals. With the QDMS Data Management System, users can build data files quickly and (Continued on Page 68)



Gene Walker (left) discusses screen output with Bob Gensamer at VS console in DP department. Systems will be in operation 24 hours per day, seven days a week.

Mini Has Hand Behind Scenes At Hotel Casino

Special to CW

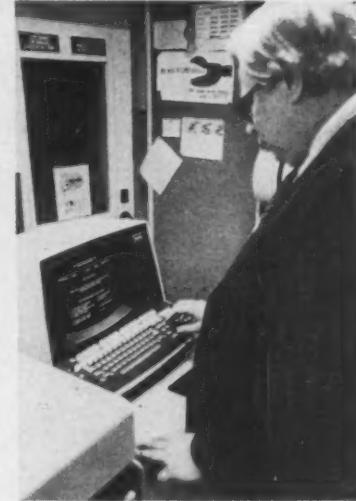
ATLANTIC CITY, N.J. — While the roulette wheels, blackjack and crap tables are not computerized, a computer is playing a very big behind-the-scenes part here at Resorts International, Inc.'s newest gambling casino.

Since last year, the casino has been using a Wang Laboratories, Inc. VS minicomputer to track payroll for more than 5,000 people, monitor the number of hours each person spends on the casino floor and keep a running tab on each person's skills and job-related abilities. The minicomputer operates with Wang's Human Resource Management System (HRMS) software which is geared to monitor each facet of the casino's business from an individual worker standpoint.

"At the present time, we have input 42 different earnings types to our system," George E. Croop, director of Resorts International's financial accounting, said. "In addition, many members of our staff work at more than one job. For example, in the casino there are a variety of gaming tables."

Labor Monitored

Labor-hour tracking requirements are unique in a gambling casino and must be accurately monitored, especially from the viewpoint of the Casino Control Commission that monitors all of the on-floor activities at the establishment. Resorts International's Atlantic City casino currently has about 400 day dealers, 400 swing-shift dealers and a variety of pit bosses, floor people and box managers.



Like hours flown by airline pilots, accrued time worked by dealers at specific games can be as important as a college degree, according to Robert L. Gensamer, assistant controller at the organization's North Miami, Fla., office.

"In order to be promoted, each [dealer] must have a minimum number of hours at a particular game or multigame experience," he explained. "When a dealer decides to leave our hotel — which we hope won't happen (Continued on Page 70)

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Three Cities to Host Small Computer Show

ARLINGTON, Va. — Small business computers, software and office automation will be the focus of a four-day conference and exposition scheduled to take place this fall in three different cities.

Sponsored by The Information Exchange, the Mid-Atlantic Computer Show will be held in Washington, D.C., Sept. 18-21, in Chicago Oct. 16-19 and in Boston Nov. 20-23.

The event will be comprised of a series of lectures dealing with a variety of small business computing aspects. Featured speakers include Lewis Kornfeld, president of Radio Shack; John Davenport, president of Software Development Corp.; and S.R. Senkus, a program administrator with IBM.

Session topics will be aimed at the issues affecting the use of computers in a small business, business software, the advantages of automation, implementation and hardware and software trends, a spokesman stated. The keynote address, delivered by Radio Shack's Kornfeld, will deal with the importance and necessity of computers to the small business venture.

The entire event is geared for small business operating executives, managers of small DP departments and small computer users seeking to expand their current capacities. Fees for the full conference and exposition program are \$245. However, special single-day rates for the first two days of the show are \$145 per day.

Additional information on the show or registration forms can be obtained from The Information Exchange, Suite 400, 1730 N. Lynn St., Arlington, Va. 22209.

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Z80-Controlled System Hikes HP Mini Print Speed

MENLO PARK, Calif. — A microprocessor-controlled printer system that reportedly gives users of the Hewlett-Packard Co. 300/3000 Series 30/33 minicomputers printing speeds up to 1,800 line/min has been announced by BDS Computer Corp.

Allowing a system more than four times faster than the 400 line/min printer supplied by HP, the HPI-33 controller includes a Z80 microprocessor, an Intel Corp. 8291 talker/listener for interfacing with the general-purpose interface bus (GPIB) and associated memory and logic circuits.

The HPI-33 program includes program control mode,

transfer mode and test mode operation. BDS supplies seven line printers.

Band printers range from 300- to 600 line/min; drum printers have 300-, 600-, 800- and 1,800 line/min speeds, and the Charaband printer

runs at 1,250 line/min.

The HPI-33 costs \$2,500, with printers ranging from \$8,200 to \$31,500, depending on speed and print technology. BDS is located at 1120 Crane St., Menlo Park, Calif. 94025.

Turnkey Aids Clothiers

WAYNE, Pa. — A turnkey minicomputer system for apparel manufacturers is available from Keton, Inc.

The Apparel Management Support System includes a Qantel Corp. 220 minicomputer, a 12M-byte disk drive and a CRT terminal. It gives apparel manufacturers a fully

automated cut size allocation system, a finished goods order allocation system and an automated pick slip generator, the firm said.

The system costs about \$50,000 from the firm at the Valley Forge Executive Mall, 530 E. Swedesford Road, Wayne, Pa. 19087.

Floppy, Winchester Disks Backed

(Continued from Page 67)
possible, a spokesman noted.

The compatible mode provides complete DEC RX02 hardware, software and media compatibility. Standard DEC software will run on the 11X without any modifications to the device handlers. To access the Winchester disk and IBM-compatible floppy disks, the controller's extended mode can be utilized with an appropriate device handler.

The extended mode also increases system throughput. Rather than transferring only one disk sector per command, up to 65K-byte data blocks can be transferred in a single

command.

Additional features of the system include test and diagnostic support, a menu-driven display and a diskette-based automatic boot for stand-alone programs.

Finally, either 13.2M or 26.4M bytes of formatted Winchester disk storage may be added to any disk system via a plug-in cable. Included with each 11X system are four rear-panel-mounted RS-232C

connectors and an eight-slot backplane for additional power or customer-furnished LSI-11 modules.

Prices for the 11X with an LSI-11/2 start at \$7,400 and \$9,995 for the system with the LSI-11/23. Add-on Winchester storage prices begin at \$3,800. Quantity discounts are also available from the company at 777 E. Middlefield Road, Mountain View, Calif. 94043.

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The AS/5000 is a two-megabyte, six-channel system, optionally expandable to eight megabytes. Through the use of advanced integrated circuit technology, the number of components, pins, and connections is substantially less than used by IBM - resulting in unsurpassed reliability. The AS/5000 is lighter, takes up less floor space, requires 50% less power, and generates about half as much heat as comparable IBM systems.

A truly flexible system, with tailored support.

The AS/5000 supports all IBM System/370 and 303X operating systems, including their extensions. The AS/5000 runs complete VM-ECPS, including EVMA, more than is offered on the IBM 3031.

In addition, we offer new, more flexible software support services. Choose between Central Program Support Services or Local Program Support Services, and get software support tailored to your specific needs.

Another important feature of the AS/5000 is its advanced microcode architecture. Through microcoding, language functions become a part of the machine itself, rather than an element of the software. This feature allows performance enhancements such as MVS/SE and VM-ECPS to be implemented, and allows the AS/5000 to remain compatible with any additional enhancements to existing

IBM systems. We provide what you really need - on-going compatibility to protect your sizeable investments in systems, software and training.

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AS/5000



Mini Plays Behind Scenes at Resort Casino

(Continued from Page 67)
pen — we must supply the new employer with a notarized record of hours worked . . . an extremely important function in the licensing and promotion process."

Skills Bank

One of the more integral parts of the VS/HRMS is a skills bank that keeps a continually updated inventory of each staff member's training, education and experience. Information from this bank can be retrieved immediately as a need arises. For instance, if the organization were searching internally for a technician who has had some training in computers, the HRMS would pinpoint those with degrees or academic experience.

Keeping an up-to-date file on employees is necessary because the Casino Control Commission maintains that a casino must try to promote from in-house before going to outside sources.

Also, "before an individual can start on the casino floor, he or she must be cleared by the commission," Gensamer continued. "It is important that we maintain follow-up on these licenses and their renewals, as well as in the work permits of all employees."

Like any business-oriented system, the VS handles payroll for the 5,000 people currently on hotel/casino's staff and will be able to accommodate the 7,000 more people expected to be hired within the next two-and-a-half years. Presently, 23 different payroll deductions reside on the VS and the system can print some 10 different types of earnings on an employee's check. The computer has also reduced the amount of paper floating around Resort International's management by about 90%.

Other Applications

Other potential financial applications include general ledger, accounts payable and job costing, Gensamer said. By-products of the system include a car-pooling system for matching riders, drivers and

shifts and a VS word processing option that will be used in credit collection and casino control regulation violation reporting.

At the moment, the Wang VS computer has two 288M-byte disk drives, a tape drive, a 600 line/min printer and six CRT workstations. Three terminals are located in the Payroll Department, and one is situated in each of the casino personnel, development and DP de-

parts. Cobol, RPG-II and Basic are being used from the VS language repertoire. But hardware and software expansion is definitely in the cards.

For instance, having work-stations directly on the casino floor is one possible avenue of expanding the system.

"We presently track, manually, about 22,000 different numeric forms per day," Gensamer noted. "Although you

can't computerize the games, there is a certain amount of paper going through the games over which you must maintain numeric control."

Possible Advantages

At some point in the future, there could be some advantages to having a computer-link right in the gambling pit, he pointed out. For instance, "they could be used to process credit verification — for peo-

ple who gamble on credit or with customer checks — for the 22,000 credit files we maintain."

But, before bringing computers to the roulette and blackjack tables, there are many other applications for system expansion that may occur first. Resorts International is a multicompany organization comprised of more than 25 firms in the U.S. and in the Bahama Islands.



Floppy Loading Automated

SANTA ANA, Calif. — An automatic floppy disk loader designed for data certification, initialization, batch terminal data storage, error logging and program spooling from magnetic tape or disk has been unveiled by Media Systems Technology, Inc.

The Media Loader subsystem is software-driven and features a stacking capacity of up to 50 diskettes in any size and single- and double-density configurations.

Individual diskettes are fed through an input hopper and then accepted or rejected into respective output hoppers after completion of a read or write function, a spokes-

man said. In addition, the device contains a halt-on-reject feature which is said to enable an operator to stop the automatic sequencing of diskettes with the last diskette in the output hopper. Up to eight loaders can be used by a single operator in a system.

The Model 1005 media loader, for 8-in. diskettes, costs \$4,075 for the single-sided version and \$5,370 for the double-sided model. The 050W loader, for 5.25-in. floppies, costs \$4,675 for the single-sided and \$4,875 for the double-sided version.

Media Systems Technology is located at 1616 S. Lyon, Santa Ana, Calif. 92705.

McAuto Hospital System Based on Microdata Gear

ST. LOUIS — McDonnell Douglas Automation Co. (McAuto) has announced a minicomputer-based financial information system which it claimed was designed to eliminate the risks often associated with hospital establishment of in-house computer operations.

The Mini-Based Hospital System (MHS) combines computer equipment manufac-

tured by Microdata Corp., a subsidiary of the McDonnell Douglas Corp., and software developed for hospitals.

"With MHS, it is not necessary for the hospital to hire computer specialists," a McAuto spokesman said. "Interactive system prompting and step-by-step instructions enable existing hospital personnel to quickly learn the procedures for the Microdata computer equipment used by MHS."

The approximate costs of MHS should range from \$4,000/mo to \$15,000/mo, depending on hospital size, volumes and options selected. McAuto can be reached at P.O. Box 516, St. Louis, Mo. 63166.

Controllers Use 6800s

NASHUA, N.H. — Functional Automation/Gould, Inc. is offering a line of programmable controllers that can be used to link multiple minicomputers in distributed networks or energy management systems.

Cyblok consists of two 6800 microprocessors. One handles applications processing while the other handles I/O processing, the vendor said.

Each unit in a Cyblok is a control point capable of operating independently or with other CPUs in its own or other Cybloks. The unit's data base is partitioned so there is no specific file location, a spokesman added.

Cybloks cost around \$20,000 each, the vendor said from 3 Graham Drive, Nashua, N.H. 03060.

Power Unit Bows

PLAINVIEW, N.Y. — The Voltector Series 5 ac power conditioners from Pilgrim Electric Co. remove electrical disturbances from the power line to protect minicomputers and microcomputers, according to the vendor.

The Voltectors come in models ranging from 1A to 20A and range in price from \$148 to \$393.

Pilgrim Electric is at 29 Cain Drive, Plainview, N.Y. 11803.

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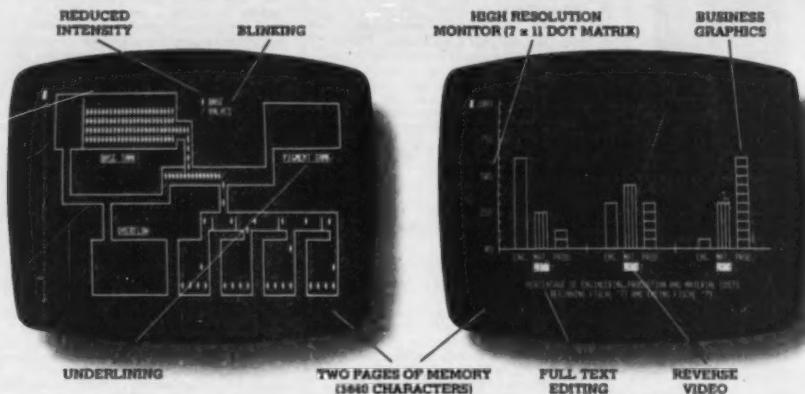
SALES ORDER ENTRY		P.O. #	A-47562-1	S.O. #	B1789-56
CUSTOMER:	LEHR SIEGLER, DATA PRODUCTS DIV.			DATE:	08/25/80
	714 N. BROOKHURST STREET			SHIP VIA:	AIR EXPRESS
	ANNEAUX, CA. 92803			DELIVER TO:	
	PHONE: (714) 774-1810				ENGINEERING DEPT.
	TELEX: 65-5444				
	TELEX: 910-591-1157				
ITEM #	DESCRIPTION	QTY.	PRICE		
1					
2					
3					
4					
REMARKS:				TOTAL	

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ADM

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IT banishes all the confusing claims being made in the computer marketplace by compressing the broad spectrum of "smart"



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IT brings you the same high standards and solid workmanship that made its cousin, the Dumb Terminal® video display, a legend in its own time. IT may be of average intelligence, but there's nothing average about IT's consistent, quality performance and sensible features.

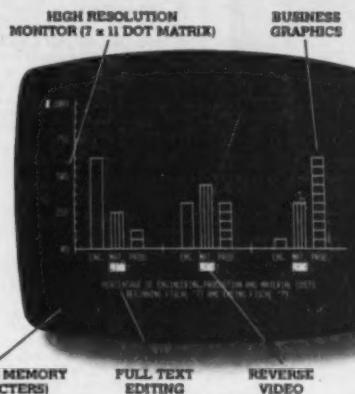
IT is completely self-contained, with full editing, formatting and protected field capabilities. Not to mention a microprocessor which increases reliability and ease of use.

TWO PAGES ARE BETTER THAN ONE.

The list of IT's special features

could go on all afternoon. Outstanding among them are the two pages of display that are standard with IT. Use them both and get up to 3840 characters of display potential. Or, allocate the second as a print buffer and be sending data on page two while entering data on page one.

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The remote computer is then in full control. And all control functions that can be initiated from the keyboard can also be executed from the remote computer.

Also on IT, full or half duplex operation is switch and keyboard selectable. You can also choose from conversation or block transmission, which can be initiated by you or the computer. In block mode, a line, a message or a page can be transmitted in its entirety.

IT IS NOT JUST ANOTHER PRETTY FACE.

IT's editing capabilities allow you to clear the screen, or use the cursor for a character change. In addition, IT comes complete with character insert and delete, line insert and delete, erase to end of line/field/screen, and tab and back tab. IT's full controls also allow you to skip protected fields, backspace, forespace, move up, down, return, home, and new line.

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This book covers Level II BASIC on the TRS-80, including a special section on converting Level I programs to Level II. It does not require a knowledge of Level I, however. It explores every important BASIC capability in detail, with the emphasis on learning how to use it, including the Editor, dual cassette operation, the real-time clock, printers and other peripherals. \$15.95

IC130

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WJ143
Advanced ANS COBOL with Structured Programming

Gary Brown

This book does not deal with the elements of programming, but goes right to its task: teaching the basics of COBOL and simplifying many of COBOL's advanced features, including sort/merge, character string manipulation, report writer, indexed and direct files, communications facility and others. Emphasis is placed on structured programming as a way to simplified programming. \$24.95



WJ139
Microcomputers
Wise, Chen and Yokely

Find out how microcomputers may change and their future impact on society in this "Technology forecast and assessment to the Year 2000. Includes microprocessors, memory, peripherals and software. \$15.95

COMPUTER INDUSTRY

Getting the Most From Trade Show Dollars?

By Jeffry Beeler

CW West Coast Bureau

IRVINE, Calif. — True or false: One of the surest ways to win new customers and develop sales leads during trade shows is to stock your company's exhibit booth fully with product literature and keep the material in plain sight at all times.

True or false: A trade show exhibitor can attract a greater than usual number of qualified customers and thus increase its sales opportunities by opening a conveniently located hospitality suite and inviting all interested visitors to come by for

free snacks and drinks.

If you answered "false" to both of the above questions, go immediately to the head of the class; you're absolutely right.

But if you answered "true" and if you have a hand in planning your company's trade show participation, chances are good your firm is wasting at least some of its resources at major industry gatherings like the National Computer Conference.

Matchless Opportunities

Trade shows provide high-technology companies a nearly matchless opportunity to showcase seldom-displayed prod-

ucts, generate new sales leads, make friends with members of the press and corral large numbers of otherwise inaccessible new customers.

Yet at the same time, the cost of renting booth space and of trade show participation in general has soared to dizzying heights.

So failure to make the most of their trade show appearances can cost high-technology exhibitors dearly, both in squandered expenses and in lost business opportunities.

But exactly how can a company's effec-

(Continued on Page 80)

By 1990, ADL Projects

Communications Mart Seen Doubling

CAMBRIDGE, Mass. — The worldwide telecommunications equipment market will more than double by 1990, with Asia setting the pace, according to a two-year study by Arthur D. Little, Inc. (ADL).

Specifically, the world market is expected to grow from an estimated \$40 billion in 1980 to about \$87.5 billion (in constant 1979 dollars) by the end of the decade, at an annual rate averaging 8.5%.

With a projected growth rate "well above the world's average," according to ADL, the Asian region will grow from 1980's estimated market of \$10 billion to \$27 billion in 1990.

The Asian spurt will come chiefly from heavy capital investments planned by five countries — the USSR, Japan, Korea, China and Turkey — according to Edgar A. Grabhorn, senior ADL telecommunications expert, who directed the World Telecommunications Study II 1980-1990.

A 1970 ADL world telecommunications study, also directed by Grabhorn, accurately predicted the current worldwide \$40 billion market, according to the firm.

Russian Market Studied

Included in the current four-volume report is the first English language in-depth survey of the Russian market, ADL claimed, which points out that the USSR currently accounts for one-third of the Asian telecommunications

equipment market.

The \$3.5 billion size of the USSR market is partly obscured by the fact that much of the equipment is obtained through barter with Eastern European countries, Grabhorn observed.

Somewhat behind U.S. developments in television via satellite, the USSR is following a similar pattern of installing hundreds of receive-only earth stations, primarily to service remote communities. On the other hand, there are about 20 million telephones in the USSR for an estimated population of 268 million

vs. 175 million telephones in the U.S. for a population of 224 million, the study found.

With about 30% of the world telecommunications equipment market by 1990, Asia is expected to have surpassed the European region and be second only to North America in size. In some cases, the country representing the largest market within a region will be displayed by another country in 1990, the study projected. For example, Russia is expected to replace Japan as the largest market in Asia.

The study breaks telecommuni-

cations equipment into six system categories: telephone; telegraph, telex and data communications; satellite communications; mobile radio and radiotelephone; radio paging; and CATV.

Grabhorn sees the proliferation of more sophisticated semiconductor devices, particularly large-scale integrated circuits, as one of the technological forces driving the continuing explosion of markets for telecommunications; mobile radio and radiotelephone; radio paging; and CATV.

(Continued on Page 82)

Offer Valued at \$60 Million

NCR Beats Mitel in Bid for Adds

HAUPPAGE, N.Y. — NCR Corp. and Applied Digital Data Systems, Inc. (Adds) have reached a tentative agreement by which NCR will acquire the CRT terminal manufacturer located here.

Adds' board of directors met to discuss the NCR offer Aug. 26 and announced their acceptance the following day, according to a spokeswoman there.

Under terms of the agreement, NCR will pay \$12 a share for the approximately 4.7 million Adds common shares. NCR will also pay \$27 a share for the company's 162,549 convertible preferred shares.

The NCR offer is valued at about \$60 million, some \$5 mil-

lion more than Mitel Corp., the only other bidder, offered.

No effective date for the trans-

action has been announced yet and Adds is awaiting a formal NCR offer.

Bryce Verdict Reaffirmed

MILWAUKEE — An appeals court judge here has affirmed a jury verdict that Arthur Young & Co. misappropriated the trade secrets of M. Bryce & Associates, Inc. when preparing a DP standards manual for one of its clients.

The jury decision was first affirmed by a circuit court judge here [CW, April 28] before it was appealed by Arthur Young & Co. to the appellate court, where Judge Leander J. Foley reaffirmed it.

Bryce filed the original suit in 1974, charging that Arthur Young stole a proprietary methodology Bryce had developed for designing DP systems. The accounting firm learned about the methodology, packaged first in a manual and later automated and called Pride, during a presentation Bryce made to the Harley-Davidson Co., an Arthur Young client, according to Andrew Riteris, Bryce's attorney.

Riteris expects Arthur Young to appeal Foley's decision.

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Hughes Aircraft Co. Gets AT&T Satellite Contract

WASHINGTON, D.C. — AT&T has awarded a \$137 million contract to Hughes Aircraft Co. covering construction of three communications satellites. Each will have a capacity of 21,600 simultaneous telephone conversations or 24 TV programs.

The satellites will be used for long-distance toll and Wats services and for any other authorized service "where the characteristics of satellite transmission might best satisfy customers' special needs," the phone company said.

The first of the Telstar 3 satellites will be launched in 1983, the second the following year and the third in 1985 or 1986. They will replace the three Comstar satellites which AT&T, together with GTE Satellite Corp., now leases from Comsat General Corp.

Pergamon International Corp. has concluded a 10-year agreement with the USSR for the compilation and exclusive distribution of modern English language abstract services and on-line data bases in science, technology and engineering. Under the agreement, Pergamon will utilize the extensive resources of Viniti — the world's largest abstracting service covering all fields of science, technology and engineering — to create jointly new abstract and computerized data base information services.

Other Awards

Lambda Biosystems, Inc. of Englewood, Colo., has been awarded a contract to place a multiuser computer system in the laboratory of St. Joseph Mercy Hospital, Mason City, Iowa.

Digital Equipment Corp. has received a \$12.8 million contract from the National Institutes of Health for multi-processor mainframe computer systems and peripherals.

The Corporation for Applied Systems, Bethesda, Md., has been

awarded a two-year contract valued at almost \$1 million by the Veterans Administration to provide ADP Technical Support Services to the VA's Benefit Systems Support Service and its seven nationwide data centers.

Contracts

Tandon Magnetics Corp. has announced the signing of a multiyear agreement with Hewlett-Packard Co. for its TM-100 5.25-in. floppy disk drives for use in HP's computational products.

Softech, Inc. has been awarded a \$598,403 contract by the U.S. Air Force Avionics Laboratory at Wright-Patterson Air Force Base, Dayton, Ohio, to participate in the development of a High-Level Language Machine, an advanced avionics computer that can execute high-level language statements.

Codex Corp. has signed a contract with Utah State Information Systems Center for LSI 48FP/LSI 96FP modems and technical control facilities.

Great American Insurance Companies of Cincinnati has signed a contract to license Policy Management Systems' Series II family of systems.

Cullinane Corp., Wellesley, Mass., has contracted for the McCormack & Dodge financial software products and plans to convert them to run under the IDMS data base management system.

Integral Business Computing has signed a \$200,000 contract with Norair Ltd., of Toronto for its Tours computerized reservation system.

Nickels & Dimes

Amdahl Corp. has filed a registration statement with the Securities and Exchange Commission relating to the proposed public offering of 1,350,000 shares of common stock. The First Boston Corp. has been named manager of the underwriting syndicate.

In addition, Amdahl Corp. will sell 650,000 shares of its common stock to Fujitsu Ltd., a principal stockholder which presently owns 32% of the company's outstanding common stock.

\$\$\$

Timeplex, Inc. has filed a registration statement with the Securities and Exchange Commission relating to a public offering of 548,288 shares of its common stock, of which 500,000 shares are to be offered by the company and 48,288 shares are to be offered by several selling stockholders. The company anticipates the offering will be made in September. The proceeds from the sale will be used for capital expenditures and working capital.

\$\$\$

Modular Computer Systems, Inc. has

filed an application for the listing of its common stock on the New York Stock Exchange. The company anticipates that trading on the Exchange will begin on or about Sept. 17.

\$\$\$

Wang Laboratories, Inc. has filed a proposed offering of \$100 million convertible subordinated debentures due in 2005.

\$\$\$

Informatics Inc. has been advised by the Equitable Life Holding Corp. that the Holding management intends to recommend to its board of directors that Holding make a secondary public offering of the 1,267,250 shares (61%) of Informatics common stock that it owns.

\$\$\$

Harris Corp. has declared an 11% increase in the quarterly dividend to 20 cent/share from 18 cent/share, raising the annual rate to 80 cent/share compared with the previous 72 cent/share. First dividend at the higher rate will be payable Sept. 19 to shareholders of record Sept. 5.

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—Chuck Petter, Data Processing Manager, Road Machinery and Supplies Company, Minneapolis.

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many large computer features. Such as distributed online work stations so users don't have to go to the computer; a central data base that makes information easier to retrieve, revise and use; the Control Program Facility, which automatically monitors and manages the flow and processing of data; online program testing, so programs can now be debugged as normal processing continues.

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Getting the Most From Your Trade Show Dollar?

(Continued from Page 75) tiveness at trade shows be improved to minimize its costs and maximize its payback? What obvious but often ignored sales techniques should an exhibitor be employing, and what common pitfalls should be avoided?

In hopes of getting answers to these and similar questions, representatives from about a dozen frequent trade show exhibitors converged here recently for a one-day seminar entitled "Getting the Most From Your Trade Show Dollars."

The seminar, sponsored by Westly Enterprises, Inc., a Palo Alto, Calif.-based conference organizer, showed attendees how their companies can boost their effectiveness as product exhibitors by following simple tips such as setting the right trade show objectives, designing an appropriate booth, using correct sales techniques and taking advantage of show services.

Each of the meeting's seven speakers urged exhibitors to follow a few commonsense "do's" and "don'ts" for maximizing their trade show divi-

dends. Some of the recommended do's and don'ts include the following suggestions.

Don't attend an industry conference simply because your competition will be there. Trade show participation should complement a company's strategic marketing and sales objectives. If exhibiting at a conference fits in well with those objectives, a company's presence at a trade show might be justified. Otherwise, a firm should stay home, regardless of what its competition decides to do.

Hospitality Suites

Control the use of hospitality suites. Only a relatively small part of the expense of running a hospitality suite goes toward promoting future sales and attracting qualified new customers. The rest of the cost is generated by free-loaders and by a company's own personnel, lured by the promise of free food and drinks.

To hold down unnecessary expenses, show exhibitors should avoid widely publicizing their hospitality suites, nor

they can meet privately to discuss the visitors' business-related problems and explore potential solutions.

Don't keep product literature in your exhibit booth, but if you do, at least make sure the material stays well concealed. The main purpose of exhibiting at a trade show is to get as many qualified customers as possible to stop at your booth and inquire about your product line. Such visits give booth personnel an opportunity to record the visitors' names and phone numbers and thus generate new sales leads.

When product literature is conspicuously displayed, however, prospective customers no longer have an incentive to stop at a vendor's booth and chat. They simply grab a handful of brochures and proceed to the next exhibit.

Study Finds 81% Buy After Seeing NCC

NEW CANAAN, Conn. — Attendance at a major trade show is followed by the purchase of one or more items that had been exhibited, a research report released by the Trade Show Bureau at the Washington meeting of the National Trade Show Exhibitors Association indicates.

Don Vaughn, bureau president, told the meeting that a study of those who had attended the 1978 National Computer Conference in Anaheim, Calif., found that 11 months after the show, 69% had already made a purchase; within the following year, 81% of all attendees would have bought something at the show.

The average purchase had reached \$254,100, and about two-thirds of these had been influenced by the show visit.

Copies of the report are available without charge when requested on business letterhead from the Trade Show Bureau, 49 Locust St., New Canaan, Conn. 06840. The complete research study is available at \$30 per copy.

should the suites be treated as social gathering places or entertainment centers. Rather,

they should be used as conference rooms where vendor salesmen and prospective cus-

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DEC LA 120	\$1895.00	\$318.00	\$105.00		HEWLETT-PACKARD	\$1895.00	\$182.00	\$ 80.00	
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Market Far From Saturation

France Leading Services Supplier in Europe

By Bohdan O. Szuprowicz

Special to CW

Western Europe's information processing services markets have been growing faster than comparable markets in the U.S. in recent years.

Although Ireland is expected to show the fastest growth — at 66% — during the 1978-1979 period, France is by far the largest European supplier of such services, accounting for almost a quarter of the \$5.7 billion market and still growing at a healthy 28% annually.

The results of a study made by the European Computing Services Association (Ecsa), which represents most information processing services and consulting organizations in Western Europe, pointed out that the European market is still far from saturation.

In comparison with the American experience, the value of those services relative to the gross domestic product of Western Europe is only 75% of comparable ratio for the U.S. But the Western European market is growing at almost 16% annually as a whole, while the American growth is now down to just under 13% per year.

If such uneven growth continues for a few more years, Western Europe will catch up with the American market in size in about 1983, when both will approach \$12 billion in annual sales.

Specific to the European information processing services business is the fact that although IBM is also the largest supplier of such services, it does not enjoy anywhere near the market share it has in production and marketing of computer hardware. This in itself opens up the possibility for many enterprises to enter the field and compete vigorously for a market share.

Fragmented Market

The European market is in fact much more fragmented than that of North America because it consists of at least 15 different national markets, each with its own peculiarities and opportunities that are creating best prospects for domestic organizations.

This explains why the top 50 European information processing services organizations can boast no more than 39% of the total market, while comparable market share of the top 50 American suppliers is almost twice as large.

Among the top 30 suppliers of information processing services in Europe are 15 French organizations, four of which — namely, GSI, CAP/Gemini/Sofeti, Cisi and SG2 — are among the five European sup-

pliers. IBM is, of course, the largest single supplier, but it is considered an American company even though it generated and sold almost \$370 million of information processing services in Europe during 1978.

The French suppliers as a group led all the other European countries with more than \$1.3 billion in sales during 1978. The country closest to

France in sales is West Germany, where information processing services and consulting sales have been estimated at almost \$950 million.

The UK, Italy, Sweden and the Netherlands are the next largest information processing supplier nations, while Ireland and Portugal are the smallest two markets in the group, valued at only \$32 million and

\$15 million, respectively, in 1978.

France's continued leadership as the largest supplier of information processing services is not entirely unexpected.

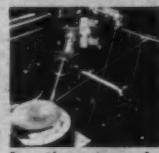
Even during the "Plan Calcul" days of the 1960s, when the French government was supporting the fledgling French domestic hardware in-

dustry, it became clear that France has neither the technology nor the market base that could hope to compete effectively with foreign (mainly American) suppliers.

At that time French DP circles and the government determined that software in all its forms would become a large and significant market as DP usage developed.

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(Continued from Page 75)
sist of advances in optical fiber manufacturing, computer system architecture and satellite communications components and subsystems.

"The outstanding technological event in the 1980s for the telephone systems industry will be the widespread introduction of digital switching at the local exchange level," Grabhorn predicted. "Every manufacturer of switching equipment is heavily committed to this approach in devel-

oping new products. With few exceptions, carriers of all sizes around the globe will adopt digital switching technology during this decade."

Grabhorn also expects short-haul digital transmission to increase more rapidly. While long-haul transmission will vary greatly from country to country, Grabhorn believes that single-mode optical fiber holds great promise as replacement for terrestrial and submarine coaxial cable. In addition, he foresees greater use of domes-

tic satellites designed for special functional applications and a proliferation of stored program-controlled private branch exchanges (SPC PBXs).

The study predicted tremendous growth in the use of satellites for long-distance transmission, with more than a fourfold increase in Intelsat usage by 1990 (up to 200,000 voice-grade half-circuits). Efficient use of the scarce radio spectrum will be achieved by mobile radio communications equipment featuring automatic vehicle identification, digital squelch, digital status reporting and frequency synthesis, according to the study.

World Analysis

Grabhorn believes the competitive environment within regions and countries will vary greatly during the 1980s. It will be determined largely by national policies and international marketing aggressiveness.

Analyzing the six telecommunications regions (North America, Europe, Asia, Latin America, Oceania and Africa), the study highlighted the following conclusions:

- Competition for the relatively homogeneous North American market is only region for which private car-

riers provide most telecommunications) will center in the private buyer sector. This market is projected to be about \$6.5 billion in 1990.

• Additional restructuring of European markets is possible in this decade, continuing the shifts in market shares which occurred in the last decade.

• The Japanese will continue to invade Asian markets dominated in the past by European and U.S. suppliers.

• In Latin America, the broadest competition will be in the interconnect market sector for equipment that can be attached to public systems.

• Oceania will continue to deal with large numbers of suppliers and remain an open market, amounting to about \$1.4 billion in 1990.

• As a developing region, Africa represents a growing market for all major suppliers.

World Telecommunications Study II 1980-1990 was completed by Grabhorn and five other key project team members, who conducted 42 in-country surveys and an analysis of more than 90% of the world's telecommunications market. Cost of the study to ADL subscribers is \$29,000; the firm is located at Acorn Park, Cambridge, Mass. 02140.

Acquisitions

Triumph Adler Activities Consolidated Into Pertec

LOS ANGELES — Computer product development, marketing and service for two subsidiaries of Triumph Adler, Inc. are being consolidated into Pertec Computer Corp.

Thomas H. Eirod, Pertec senior vice-president, said 200 people at more than 20 Royal Computer Systems domestic field and headquarters locations are already in the process of integrating into the Pertec systems marketing and service divisions. Integration of computer-related activities for Triumph Adler's Pertec and Royal units into one organization will strengthen the channels of distribution, product development and field support activities in the U.S., he added.

The resulting domestic computer systems organization will continue to market the 8000 and 9000 series of small computers developed by Royal as well as the PCC 2000 small business system manufactured by Pertec. Field service personnel will be cross-trained to support Pertec products and the 8000 and 9000 series of computers as well as various other computer products previously serviced by the Royal computer products organization.

Pertec is a wholly owned subsidiary of Triumph Adler, which in turn is owned by Volkswagen AG.

Other Moves

EG&G, Inc. has acquired Almond Instruments Co., Inc. through an exchange of common stock. Almond Instruments, located in Covina, Calif., develops and manufactures custom power conversion systems.

Digital Scientific Corp. has acquired Computer Office Systems, Inc., pro-

ducer of an office business and word processing system.

Total Systems, Inc. has acquired Performance Systems of Indianapolis, which specializes in computer resource monitoring.

National Data Corp. has announced an agreement in principle for the acquisition by National Data of Cisco, Inc., a financial DP subsidiary of the First National Bank of Atlanta.

Automatic Data Processing, Inc. has acquired Business Systems Research, Inc., a supplier of computerized tariff data bases and accounting and documentation systems.

Anacomp, Inc. has completed the acquisition of Computer Management, Inc. for stock and cash totaling \$1.4 million.

Tandy Corp. has reached an agreement in principle with the shareholders of Like Corp., manufacturers of double-sided and multilayer printed circuit boards, to acquire Like for \$4.5 million in cash and notes.

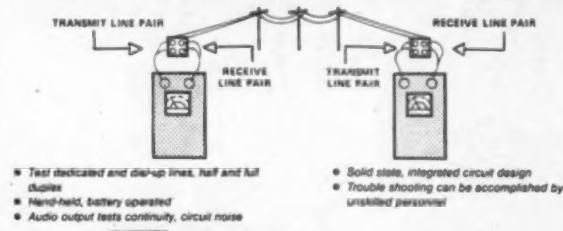
Remote Computing Corp. has completed negotiations for the acquisition of Fiscal Recovery Associates, Inc. of San Mateo, Calif.

Sytek, Inc. has acquired Network Resources Corp., a data communications equipment firm specializing in broadband cable television interface hardware and related technologies.

Cuadra Associates, Inc., a Santa Monica, Calif.-based R&D firm specializing in on-line data base systems and services, has acquired the staff and resources of Knowledge Resource Consultants, library systems specialists.

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Projected \$2 Billion for 1985

Exxon Expected to Make It Big in Information

NEW YORK — Despite current problems with management defections and antiquated word processors, Exxon Corp. will stick it out and make it big in information, according to a report published by Northern Business Intelligence, Inc., a market research firm based here.

Major advancements in word processing, DP, computer components, telecommunications and electronic funds transfer (EFT) systems will put Exxon back on the leading edge, the report said. Northern further speculates that Exxon information sales will top the \$2 billion mark by 1985.

Exxon office product ventures — Qwip, Qyx and Vydec — all achieved

early market success, but recently Exxon has been losing ground, particularly in word processing. Despite the introduction of the new 2000/4000 word processors and Netword shared resource system, Vydec will have problems regaining market share, the report said.

Xonex, another Exxon company in the development stage, may become Exxon's star in the word processing field, overshadowing both Vydec and Qyx.

Committed to Micro Systems

Exxon is committed to microcomputer system development through Zilog, Inc. and the recently formed Sum-

mit. Zilog has just introduced an Ethernet-type networking system for its micros, and Northern speculated that Zilog may soon supply end-user markets.

Northern predicted that Exxon's office product sales will grow from \$146 million in 1979 to \$695 million in 1985.

While full systems integration is some time off, Northern said Exxon is paying close attention to integrating the organizations of its disparate information operations and to developing networking capabilities. Four distinct paths to systems integration are being pursued. Northern believes software development may be Exxon's biggest

problem in tying the loose ends together.

Through Dialog, Kylex, Inc., Magnex Corp., Zilog and others, Exxon is leaving essentially no stone unturned in components and subsystems for information processing, storage, display and entry, Northern said. Component sales were forecast by Northern to grow rapidly from their 1979 level of \$49 million.

Exxon has launched a broad assault on the telecommunications business, the research firm reported. Intecom, Inc., a new venture, has announced its first product: an advanced data/voice switch.

(Continued on Page 84)

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Case for Intangibility

Software Tax Proposal Blasted in Bay State

By Marguerite Zientara

CW Staff

BOSTON — A proposed regulation of the Massachusetts Department of Revenue that would tax off-the-shelf software, time-sharing, keypunching, data conversion and some output services came under heavy fire last week at a public hearing here.

After an impromptu change of venue due to the unexpectedly large attendance — more than 100 people overflowed a room designed to hold 50 — Tax Commissioner L. Joyce Hampers opened the hearing at which 15 businessmen, both DP and non-DP, pleaded their case for the intangibility of software and services.

Software may be entered into a computer directly or via telephone lines with no tangible personal property and

with the identical result as if tangible property were used as the input communications medium, software tax hearing veteran Robert M. Sherin, nonjudicial legislative adviser for the Data Processing Management Association (DPMA), told the tax commission.

This point was the first of five key arguments used successfully by the DPMA in New York, Florida, Rhode Island, Wisconsin and Michigan.

DPMA Presents Case

Furthermore, the DPMA argued:

- Such communications media are merely an intermediate means of entering software into a computer on a one-time basis before it is transformed into its intangible end state of binary pulses.

• Tangible property, if any, is either destroyed or reused after being used to transfer the intangible information therein to the computer on a one-time basis, leaving instructions (program) and information (data) in the computer in the form of binary pulses as the intangible end state.

• The value of such tangible property is small — 5% or less — in comparison to the value of the intangible software.

• Any tangible property, if used, has virtually no value in itself. Any value is in the information which is valuable only when read and transformed by the computer into its intangible end state of binary pulses.

Sherin likened computer output to an accountant's reports, a court reporter's paper tape and a typist's typed sheet — objects that are considered intangible for tax purposes because the objects are inconsequential to the information contained therein.

Addressing the Department's proposed taxation of keypunching, S. Paul Blumenthal, vice-president of American Computer Appraisal Service here, termed the idea "discriminatory" since it would "amount ... to taxing labor."

He also stressed that computer software object code, or machine-readable program language, has been found to be intangible and nontaxable in federal court, and therefore that finding should hold for Massachusetts.

After discussing the "true object" of a DP transaction as being the intangible information — a recurring theme at the hearing — Ronald J. Palenski, attorney for the Association of Data Processing Service Organizations, Inc. (Adapso), further claimed that the Department of Revenue's distinction between prewritten and custom programs is "artificial and irrelevant."

"In both instances," he noted, "what is sought by the customer is the professional skill and intelligence represented by the program."

Citing New York, California, New Jersey, Wisconsin, Texas and "many other" states that do not tax time-sharing services, Palenski isolated a key issue in Massachusetts' proposed rule regarding whether a customer controls or operates the computer in a time-sharing situation.

"There is never exclusive use by any particular customer, nor does any customer have the right or the means to exclude others from the system," Palenski explained. "No single customer controls the hardware, or decides when a job will be done — the computer decides that."

Hampers set a time limit of 60 days for further written or oral statements from interested parties.

Comments should be directed to John White, chief of the Rules and Regulations Bureau, Department of Revenue, Room 810, 100 Cambridge St., Boston, Mass. 02204.

Exxon Expected to Make Big

(Continued from Page 83)

Intecom will have difficulty breaking into the market, but with leading edge technology and Exxon resources, this small company will make it, Northern said.

Last year's purchase of Reliance Electric Co. has thrust Exxon into the nuts and bolts carrier, voice frequency, outside plant and power markets.

Other Exxon communications products include communications controllers, voice recognition-based network

controllers and fiber-optic data links.

In EFT systems, Periphonics may build its credit authorization terminal line into the point-of-sale terminal area, the report said. But Northern believes Exxon is assessing its future in EFT and has no plans for automated teller machines or integrated EFT systems development.

The complete report is available for \$250. Northern Business Intelligence is at 150 Nassau St., New York, N.Y. 10038.

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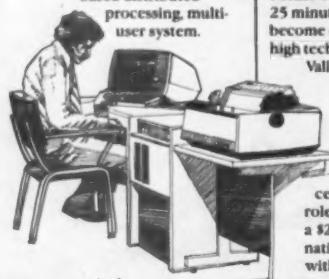
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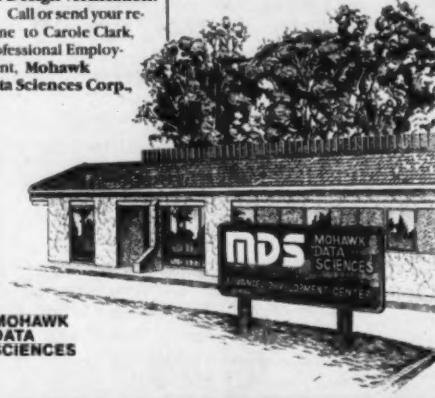
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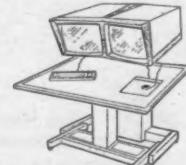
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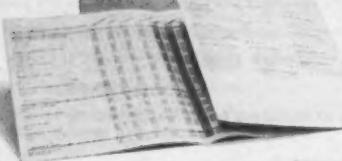
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Spectra Medical Systems designs and installs minicomputer medical information systems throughout the world. Our systems provide hospitals and medical centers with on-line order entry and management of patient data and services. By working with our users in Saudi Arabia, you can combine a once-in-a-lifetime opportunity to travel, with the satisfaction of contributing to life-sustaining work.

Using Data General computers and peripherals and Spectra's utilities and software, you will set up and terminate systems and perform crash procedures. Experience with Data general, including ECLIPSE C/330, C/150, C/350 and Nova 3 computers and associated hardware is desirable. Familiarity with Data General software and utilities (AOS and RDOS) would also be helpful.

We'll provide you with a superb benefits package including fully paid airfare and travel arrangements, free housing and utilities, and 40 DAYS PAID HOLIDAYS AND VACATION PER YEAR, with \$1,000 "R&R" pay.

Take advantage of this rewarding opportunity with a young, dynamic, rapidly growing company. Send your resume in confidence to: S. Altstadt, Spectra Medical Systems, Inc., 475 Potrero Avenue, Sunnyvale, California 94086. An equal opportunity employer m/f.

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A Unit of Whittaker Corp.

Teleprocessing Trouble Isolation Analyst

Fireman's Fund Insurance Companies' teleprocessing network is growing rapidly, and we're looking for talented professionals to take part in these challenging and exciting times.

To qualify, you should have troubleshooting knowledge of non-switched (point-to-point and multi-drop) and switched networks, test equipment, IBM TP protocols, terminal/minicomputer systems, 3705 operations and the ability to interface with users/vendors.

We offer excellent benefits including staggered work hours, and a generous relocation package. And of course very competitive salaries. For immediate attention to your inquiry, call TOLL FREE anytime: 800-821-2280, ext. 903. If unable to call, send your resume, including salary history to: Bernie Bernstein, Recruiting Consultant, Fireman's Fund Insurance Companies, 1600 Los Gatos Drive, San Rafael, CA 94911. An equal opportunity employer m/f/h. Please, No Employment Agency Calls.



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Permanent (tentative) position beginning January, 1981 at the Instructor, assistant professor or associate professor rank. Salary range: \$13,630 - \$31,880. Duties include teaching 12 credits per semester of undergraduate Computer Science courses, beginning through upper level, in an approved Computer Science program; assisting in the development and teaching of new Computer Science courses, advising students, working on grants and contracts, and participating in academic and professional activities. A background in FORTRAN, COBOL, and a block structured language useful, and some experience in computer science desirable. Qualifications: For Instructor - minimum of Bachelor's in Computer Science or related field plus 15 graduate credits; three years teaching and/or data processing experience; For Associate Professor - minimum of Bachelor's in Computer Science or related field, plus 10 graduate credits; four years teaching and/or data processing experience; PhD desirable. For associate professor - Doctorate in data processing degree plus 40 semester hours of graduate credit in Computer Science or related field; five years teaching and/or data processing experience; and some experience in computer science. M. Berlek, Chairman, Computer Science Department, Indiana University of Pennsylvania, Indiana, Pa. 15705 by October 17, 1980.

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We are a growth-oriented electronics manufacturer located in Fort Lauderdale. We are searching for an Information Systems Manager to help us implement and manage new on-line systems on our installed DEC 11/70.

This management position provides challenge and growth opportunity for the right MIS professional. The position is responsible for all facets of information systems including: implementation of systems, management of professional staff members and support for our user departments. Required is a minimum of five years of information systems experience, knowledge of information systems design, a thorough familiarity with financial and manufacturing applications with a broad understanding of hardware and software.

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PSL

REAL TIME PROGRAMMER II: Bachelor's in computer science, engineering, or math; one year experience in programming mini computers for real time applications; or any combination of experience, education or training providing working knowledge of FORTRAN and assembler languages; familiarity with structured programming techniques; experience with DEC real-time systems; able to implement, test, maintain and document real-time programs; work without day-to-day supervision. Salary is \$16,284 DOE, application deadline September 22. Refer to 123-29.

REAL TIME PROGRAMMER IV: Bachelor's in computer science, engineering, or math; experience in programming mini or medium scale computers for real time applications or any equivalent combination of experience, education or training providing working knowledge of FORTRAN, assembler languages and PASCAL; familiarity with structured programming techniques and block structured languages for DEC computers; real-time operating systems experience; able to design, implement, test, maintain, and document real time programs; work without day-to-day supervision; familiarity with data acquisition/telemetry systems and techniques desirable. Salary is negotiable DOE, application deadline September 19. Refer to 124-29.

Personnel Department (123-29) (124-29)
Physical Science Laboratory/NMSU
Box 3-PSL
Las Cruces, New Mexico 88003

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Physical Science Laboratory

UNIVERSITY OF PETROLEUM & MINERALS DAHRAHAN, SAUDI ARABIA

The Department of Systems Engineering has immediate openings for faculty positions for the academic year 1980-81, starting 1 September 1980.

Academic qualifications and experience:

PhD Degree with emphasis on systems and control, operations research or digital systems preferably with teaching experience. Language of instruction is English.

To apply send complete resume on academic, professional and personal data, list of references, publications and research details, and with copies of transcripts and degrees, including home and office addresses and telephone numbers to:

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Houston Office
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Houston, Texas 77027
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A major national expansion program of Data Access Systems, Inc., one of the nation's largest independent data terminal distributors, has created openings for:

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Plus, sixteen new offices opening within the next four months will create a number of employment opportunities for:



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If you are a dynamic self-starter with experience in the sale of computer terminals, computer peripherals, or time-sharing services, we could be a match. Successful candidates will be involved in the sale, lease, and rental of computer terminals . . . and will drive a Mercedes-Benz 450 SEL, 300 SD, or 300 D Company Car.

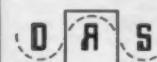


118 CUSTOMER SERVICE ENGINEERS

These positions require experience on such data terminal products as TI, LS, HP and GE. Applicants should also be highly motivated and task oriented, with technical school certificate or equivalent. Successful candidates will receive complete company training and technical support, along with a Datsun 280 ZX 2+2 Company Car.

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Send resume or call Susan Brown at 800-257-7748. (In New Jersey call 800-232-6510.) All replies will be held in strict confidence.



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We are looking for an experienced manager or supervisor who is a self-starter with strong organizational skills to take over supervision of the Technical Reps Department. Individual will be involved in heavy interface with customers regarding installation and maintenance of hardware and software. Experience with minicomputers is a must. Prefer DEC. Knowledge of FORTRAN required and MACRO 11 preferred. Exposure to hardware for minicomputer required. Must have previous supervisory/management background.

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Due to recent expansion of our MIS Department including implementation of new hardware and reorganization by application system functions, we have several openings for aggressive self-starters with some technical expertise in Data Base Systems (IDMS-DB/DC) in the listed areas:

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Should have a minimum of 3 years experience within a manufacturing company, preferably involved with MRP &/or shop floor control systems. We are looking for an individual who shows the ability to become a future project leader and be highly involved with the user interface. This position will implement and develop programs in a multi-plant environment. Will encompass approximately 75% systems analysis work and limited coding (ANS COBOL).

SR. PROGRAMMER ANALYST

We are looking for an experienced Programmer Analyst (2 years minimum) interested in joining our financial and distribution system group. This position, on our MIS staff, is highly involved with marketing, distribution invoicing, order entry, sales forecasting and basic financial systems.

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A systems specialist familiar with the design of company Data Bases to assist with the complete conversion from DBOMP to IDMS. Knowledge of COBOL required.

PROJECT LEADER

Multiple plant environment requires experienced MIS professional to lead in the conversion of current systems to new IBM COPICS and Data Base/Data Communications oriented systems. IDMS Data Base experience a plus.

We offer highly competitive salaries and a complete range of benefits. If you are interested in meeting the challenge of a growing organization and department, please submit confidential resume or call:

JoAnn Palmer

(414) 637-6711

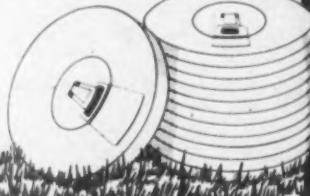
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- The ability to write and present technical materials clearly and effectively.
- Knowledge of the internals of one or more IBM virtual operating systems (MVS, SVS, VS1, 1M, DOS/VS, DOS/VSE).
- College degree (or equivalent experience).
- Knowledge of any of the programming languages (FORTRAN, COBOL, PL/I), and a high level of proficiency in ALC desirable.
- Ability to learn advanced systems and new software and hardware technology.

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For fast consideration with absolute confidentiality, send your resume to Fred Moore, STORAGE TECHNOLOGY CORPORATION, 2275 South 55th Street, MD/3-M, Louisville, Colorado 80027, or give him a call TOLL FREE 1-800-525-2840, Ext. 3006, for additional information. We have a lot to say that you'd like to hear!



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CORPORATION

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REQUIREMENTS

- 5-7 years ANS COBOL programming
- 2 years hands-on system design
- user interface experience
- project team experience
- experience with UNIVAC 90/80-90/80 or IBM 370 OS
- job control languages
- degree in computer science or related field.

PROGRAMMER/ANALYST

REQUIREMENTS

- 2-3 years COBOL programming experience in OS/370 or UNIVAC VS/9 environment
- manufacturing experience
- some experience with analysis and design
- ability to work productively as a team member.

Both positions offer attractive salary, excellent benefits and career opportunity. Send resume and salary history in confidence to:

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POSITIONS AVAILABLE

Senior Systems Analyst — Perm. position with initial assignment as major task leader in dev. of requirements analysis for a statewide judicial information system. Requires B.S. degree, higher degree preferable; 5 yrs. of systems analysis exp., preferably in judicial or criminal justice information system; demonstrated exp. and skills in systems design and documentation; and good oral and written communications skills. Exp. with various levels of judicial personnel highly desirable. Prefer applicants with consulting or management exp. Salary \$27,332-\$33,223. Send resume immediately and no later than September 15 to National Center for State Courts, SEC. NJBN, 300 Newport Avenue, Williamsburg, VA 23185. The National Center is an Affirmative Action Employer.

Systems Analyst — Perm. position with initial assignment on national-scope information systems project. Performs eval. of system for possible transfer, assessment of and planning for systems development projects, and other analytical tasks within the court environment. Provides tech. assist. to individual state courts and adminis. offices. Minimum requirement Bachelor's degree or higher; 1-3 yrs. of systems analysis exp., preferably in judicial or criminal justice information systems; exp. in systems design and documentation; and good oral and written communications skills. Exp. with various levels of judicial personnel highly desirable. Salary \$18,499-24,791. Send resume to the National Center for State Courts by September 15, SEC. BYB, 300 Newport Ave., Williamsburg, VA 23185. The National Center is an Affirmative Action Employer.

Systems Manager Data Point Installation

Knowledge of programming operations and job control in a Data Point/Data Share environment. One to two years experience. Southern California area.

Contact Joel Sherman
714/875-8552

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Important Notice to EDP Professionals

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We are seeking qualified professionals for the positions and industries listed to the left, in state-of-the-art commercial (CICS, IMS, MVS etc.) and other disciplines (graphics, compiler, OPSYS design etc.) Starting salaries: \$18,000 to \$40,000.

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Products will include Digital CRT Phototypesetters, Multi-Terminal Editing Systems and Interactive Graphic Display products.

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Field sales and support jobs require at least 3 years of relevant experience in the graphic arts, word processing or computer industry, a strong desire to advance, and a willingness to learn. Bilingual capability would be very desirable.

All jobs require extensive travel. Salaries will be top-level, and commensurate with experience. Canadian citizenship or landed immigrant status in Canada are preferred but not required.

Please forward resume with salary history to:

Mr. George Grable
Sears Systems Division
225 Norelco Drive
Weston, Ontario M8L 1B5
Canada
416-748-6129

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**Operating Systems
Team Leader**

If you think "point-of-sale" merely means clever cash registers, then there's a lot you should know about POS systems at National:

We are the POS Division of National Semiconductor and in our business we lead — our DATACHECKER products are installed in most of the leading supermarket chains. We build turnkey systems that do the TOTAL job (what you see in the front of a store doesn't tell half the story!)

Right now, we're looking for a very special person to lead the development of a totally new multi-tasking transaction processing operating system. As the key to the development of a major new product line, you'll need at least 6 years of proven successful experience in the development of small/medium scale business-oriented operating systems and related software. You should already have some leadership experience, although we are very flexible on how much, and at least a BS. MS preferred.

If your background resembles the above, and you are looking for a position with outstanding career potential then we'd like to talk with you.

Send your resume, in complete confidence, to Nancy McAuliffe, Professional Employment, National Semiconductor, P.O. Box 2808, Department 3-51-1, Santa Clara, CA 95051; or call her COLLECT at (408) 737-5840. An affirmative action employer.

National Semiconductor

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Santa Fe Energy is a Great Place to Grow

Energy is where the action will be in the coming decades, and Santa Fe Energy Company will be at the forefront. With operations in Texas, New Mexico, Utah, Wyoming, Montana and offshore Louisiana, we're the nation's fourth largest independent oil and gas exploration and development company. Our parent company, Santa Fe Industries, is one of the nation's largest diversified corporations. In addition to competitive salaries and a chance for real career growth, we offer excellent company benefits including health, dental, life, disability and retirement. Come grow with us.

Amarillo is a Great Place to Live

Amarillo sits on the northern edge of the Sunbelt, escaping the humid, suffocating summers of the deep south and the bitter cold winters of the north. Anyone who lives here will tell you its sunsets and summer nights are the best anywhere. Its air is still the clean air of the prairie but its surrounding land has been turned into one of the garden spots of the nation. Amarillo still boasts a western heritage and flavor but its culture, alive with art and music and literature, is a mix of influences from Denver, Dallas, Albuquerque and Oklahoma City, each of which is just a short drive away. And a half-day's drive puts you in the Rocky Mountains near any of four popular ski areas. Its schools, including a university and junior college, are excellent. Housing is inexpensive by national standards, averaging only \$28 to \$32 per square foot for new brick construction. And property taxes are low. The local economy is strong and there is no state income tax. Amarillo is a great place to live and raise a family.

Our installation is an IBM 370/168 6 meg system currently running OS/VS1 with plans to upgrade to MVS this fall. We need people to fill the following positions:

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DATA BASE ANALYSTS — Minimum three years experience with IBM OS COBOL.

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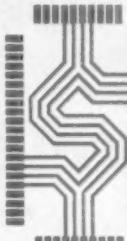
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The successful applicant should have a minimum of 2 years experience in micro or mini computer sales. A B.S.E.E. degree is desirable but not necessary. Experience with Burroughs or IBM 3270 terminal products helpful.

SALES/APPLICATIONS ENGINEERS

The successful applicant will have an associate degree and electronic technology or comparable military training and 1-5 years experience. Microprocessor, Burroughs, IBM 3270 background helpful.

Beehive International offers an attractive compensation package. For confidential consideration submit resume including salary history to: Personnel Department, P.O. Box 25668, Salt Lake City, Utah 84125.



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Do you have 1+ years experience in business applications? Do you plan to visit or relocate to this area? If so, we can arrange interviews for you. Call us collect or send your resume and itinerary and we will get right to work.

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of Seattle, Inc.
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Computer services firm needs Programmers & Programmer Analyst to participate in system/customer support & development of new on-line applications.

This is a multi-3033 MVS installation utilizing IMS, CICS, TSO & JES III.

The company offers in-house training on IMS, CICS, TSO, JES III, & Structured Programming.

Requires 1-5 years experience COBOL Programming or systems design on any large frame computer 360/370 OS or DOS, Univac 1100, CDC Cyber, Honeywell, etc. (Non-citizens with green card are welcome.)

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Will be responsible for OIS generation of RSTS-E or

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HOME FEDERAL SAVINGS & LOAN ASSOCIATION is San Diego based, \$4 billion Association, is expanding and is currently seeking a Computer Professional in the following area:

SYSTEMS ANALYST

Requires an individual with strong systems analysis experience, project management abilities, excellent user communications and the ability to modify new and redesigned systems. The ideal applicant must have consumer installment lending experience and indirect experience on large scale IBM equipment, MVS, CICS, IMS, and on-line systems design.

Excellent benefits
Please send resume in confidence to:
Kay C. Kenyon
Management Employment Officer

HOME FEDERAL SAVINGS & LOAN ASSOCIATION
P.O. Box 2070
San Diego, CA 92112

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SOFTWARE TECHNICIAN

High school graduate, minimum 8 months formal, vocational, technical or equivalent training. One year experience on the job or 2 years in computer programming and data processing. Test programs; troubleshoot programs; maintain and update installation of new programs on IBM-DS, IBM-COS, CDC, and UNIVAC; maintenance of lease program tapes; patching, converting programs; writing technical reports; establish tape library; 40 hours per week, \$13.00 per month. Send resume to Dr. R.C. McFarlane, Vice President, Scientific Software Corp., 633 Seventeenth St., Denver, CO 80202. (303) 871-1111.

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Work in growing information systems division of 452 bed community hospital located in central California. Beautiful recreational area near 3 national parks. Department plans include sophisticated on-line distributive processing with DEC-20 and PDP-11 series. Programming languages include MACRO, COBOL, and FORTRAN. Applicants should have at least 2 years programming in business and hospital applications. Send resume and salary requirements to:

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Fresno Community Hospital
P.O. Box 1232, Fresno, CA 93715
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Billion dollar electric utility company with centralized data center has immediate need for persons within the rapidly expanding corporate Information Services Department to test and install new or modified systems software.

Positions at multiple levels offer growth potential for professionals demanding challenge and opportunity. Present staff expanding to support installation of second 3033 with MVS/SPI and 2 as well as 4300 distributive process network.

Present state-of-the-art IBM 3033 environment is MVS/SE2, ACF/VTAM with 600 CICS, ROSCOE, and TSO terminals.

Mail resume and salary history to Employee Relations Division, Management Recruiting Department.



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Application areas include:

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- Distributed computing system applications
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- Resource utilization and management systems

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- Engineering/management support systems
- Data communication applications

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- JOVIAL
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- ADA
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- Top-level software system definition
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Special openings in the following areas:

- Software management
- Distributed data processing system/architecture design
- Software training: languages, design procedures, computer architectures
- Compiler development
- Functional analytic simulation

Applicants should have a BS, MS or PhD in Engineering, Computer Science or related field.

Software Configuration Managers

Exciting ground-floor opportunity exists today for experienced software configuration managers. Candidates should have a BS/MS and a minimum of 3-5 years' related experience in software development for military contracts. Applicants should have a successful record in both the planning and implementation of software configuration, and be familiar with MIL-STD-1679, MIL-STD-483 and MIL-STD-1521A.

Send your resume in confidence to: Ed Haynes/P.O. Box 401628, Dept. 137/Dallas, TX 75240.

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MANAGER SOFTWARE QUALITY ASSURANCE

CRYOVAC, a leading producer of plastic packaging systems, is seeking a Manager of Software Quality Assurance at the division headquarters within the Greenville-Spartanburg metropolitan area of South Carolina.

The individual selected for this position will be responsible for developing quality standards and procedures for all areas within M.I.S. to include operations, technical services, systems and programming and data base administration.

A degree is preferred, along with a minimum of 5 years experience in programming and systems analysis. An additional requirement of this position is a knowledge of operating systems software and on-line application.

CRYOVAC offers an excellent compensation and benefits package and provides the opportunity to develop professionally with an expanding company. If you would like to join our progressive team, please send your resume and salary history in confidence to:

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EXECUTIVE DIRECTOR OF COMPUTING FACILITIES NORTHERN ILLINOIS UNIVERSITY

Northern Illinois University, a state supported university of approximately 25,000 students about sixty miles west of Chicago, invites applications for the position of Executive Director of Computing Facilities.

The Executive Director of Computing Facilities reports directly to the President and has overall responsibility within the computing area for all instructional, research, and administrative functions, for facilities development and utilization, for long-range planning, for budget development and for advisement of the President and his staff major computer issues.

Computing Facilities, with a professional staff of ninety, a budget of 4.1 million dollars and an Amdata VTA operating under M.V.S., is comprised of three divisions: Systems and Operations, Academic Computing Services, and Administrative Computing Services.

Applicants should minimally have a Master's Degree in an appropriate field, demonstrated technical expertise in current hardware and software, experience and demonstrated skills in management of large-scale computer facilities, preferably in an academic environment. Salary is competitive and commensurate with experience.

TRANSMIT APPLICATIONS BY: October 1, 1980 to:

Clyde W. Kirchhoff, Chair
Executive Director Search
President's Office
Northern Illinois University
DeKalb, Illinois 60115

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Project Manager

Our Bay Area client has an excellent opportunity for an EDP Project Manager. The successful candidate's background should include:

- Strong leadership skills
- The ability to communicate both verbally and in writing to all levels of management.
- Knowledge of Banking or Manufacturing Applications and Time Sharing Applications.
- Good working knowledge of COBOL, ALC or FORTAN.

This position offers an excellent salary and compensation package.

We are consultants to management. For immediate and confidential consideration, send resume and salary history to Clasy VanBalen, Professionals for Computing, Inc., One Maritime Plaza, Suite 1350, San Francisco, CA 94111. (415) 956-7120. Employer assumes fee.

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Search & Personnel Services

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WABCO, Fluid Power Division of American Standard, has a challenging opportunity for the qualified systems and programming professional.

The successful candidate will be responsible for the supervision of the systems and programming activities, as well as providing technical guidance, in an RJE environment. To be qualified you will possess strong technical skills in assembler, ANS COBOL, MVS, OS, JCL and DB2MP or other database systems in a manufacturing environment. The candidate should also possess good communicative skills and previous project leader or related supervisory experience.

A college degree and previous experience with the implementation of MRP and related manufacturing control systems is desirable.

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177 Walton Road
Blue Bell, Pennsylvania 19422
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Computer Professionals

Rensselaer Polytechnic Institute, a prestigious, technologically oriented private university located in beautiful upstate New York is expanding its network of timesharing terminals and distributed mini/micro computers using the IBM 3033 system. We are conducting a search for experienced individuals to actively engage in the following areas:

Network and Communications Specialist

Will participate in the design, implementation, and support of a communications network using "ether" and X.25 technologies, using the IBM 3033 as one of several hosts. Previous communications and network design experience is required.

Systems Support Specialist

Will enhance and support major areas of the 3033 operating system and related software. Prior experience with the internals of an operating system is required.

Compiler Specialist

Will enhance and support compilers, interpreters, and multi-language support systems for use on the IBM 3033. Prior experience with compilers is required.

Graphics and Applications Support Specialist

Will enhance and support major new applications systems using the IBM 3033. Previous experience with graphics software and with applications package support in a university environment is desirable.

Database Support Specialist

Will enhance and support the SPIRES database system on the IBM 3033. Previous experience in the design or support of database systems is required.

BS degree and 2 years experience in related area required. Academic experience desirable.

RPI offers salaries commensurate with experience and a complete benefits package which includes advanced educational opportunities.

For immediate consideration, interested and qualified applicants should submit resume, three professional references and salary requirements to:

Thomas F. Molloy
Employment Manager
Rensselaer Polytechnic Institute
Troy, New York 12181

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These senior level positions involve order entry processing, materials management and related applications in an on-line data base environment. At least 3-5 years experience that includes COBOL, OS/VS JCL, CICS, IDMS, MARK IV, Project Management Methodologies or Distributed Data Processing is applicable. A degree or equivalent experience is also required.

Abbott offers a highly competitive salary and full benefits including relocation assistance, cash profit sharing, comprehensive life, dental and medical insurance, stock retirement program and more. For consideration, send a resume with salary history in confidence or call collect:

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SYSTEMS ANALYST

Engineer

Burns & McDonnell, an architectural/engineering firm located in Kansas City, Missouri, is in search of an individual to provide user support, technical evaluation and development of structural and mechanical design and analysis of computer programs. Must have BS in engineering with experience in theory and application programming of structural and piping programs.

Send resume to Doug Petersma.

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Salaries starting from \$22K.
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MINIMUM REQUIREMENTS: Knowledge of computer and peripheral operations, ability to code and maintain COBOL develop systems, an understanding of full operating systems, database management, virtual systems and direct accessing techniques. Send resume to: James T. Kennedy, City Auditor, City Hall, Lowell, MA 01852 on or before Sept. 29, 1980.

MARK IV

PROGRAMMER / ANALYSTS

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(201) 444-9800

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California 91360
(805) 497-8975

STEVE COMEAU
SRZ Software Services
The Jenney Building
Route 101A Amherst
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Plano, Texas 75023
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Note: Additional considerations made to those who are capable of extended or frequent travel.

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Leading international public accounting and consulting firm seeks an experienced user-installer of large scale IBM 370 general ledger application software. The position is in the World Headquarters software research group in Chicago. Responsibilities include monitoring package status of various vendors, evaluating new packages and releases and assisting our personnel and clients in evaluating and implementing application software.

Candidate should have an MBA or MS in computer science or a bachelor's degree with an accounting major. A minimum of 3-4 years experience in accounting systems including substantial recent package implementation is required. Demonstrated technical skills must be combined with exceptional written and verbal communication skills.

Starting salary will be from mid \$20's and up, depending on qualifications plus relocation. An opportunity for rapid advancement exists in our organization, with a full employee benefit plan available.

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Work in Houston on the world's biggest overseas projects

Aramco is the key firm involved in the development of the energy resources of Saudi Arabia.

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You'll be based in Houston, but from time to time you will be required to travel to vendors in the U.S. and to field sites in Saudi Arabia.

Interested? Send us your résumé and we'll get back to you very soon. Write: Aramco Services Company, Section DOM, Department CW090880JLSB, 1100 Milam Building, Houston, Texas 77002.

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You will be responsible for developing hardware specifications for equipment used in the medical information system. You will also evaluate and provide hardware design for external sources & provide technical assistance for new & existing customer contracts.

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For immediate consideration, send your resume to: NORTHWEST PIPELINE CORPORATION, Attn: Fred Thomas, Employment, P.O. Box 1526, Salt Lake City, Utah 84110. Or call COLLECT (801) 534-3921. We are an Equal Opportunity Employer M/F.</p> <p>NORTHWEST PIPELINE CORPORATION</p>		<p>NATIONWIDE PERSONNEL SERVICE, INC. EDP Recruiters Since 1968</p> <p>DATA PROCESSING CAREERS 1,000 + Current Positions</p> <p>That's right! On a consistent basis there are more than 1,000 EDP positions listed through Nationwide and our Associates. But the best in the business Data Processing Professionals have relied on us for 12 years.</p> <p>The Other Reasons:</p> <ol style="list-style-type: none"> 1. Fast & confidential placement on an individual basis by our team of 10 professional consultants. 2. Major National & International Clients. 3. Fees & expenses 100% Co. paid. No contracts! 4. 220 affiliates in 140 North American cities that we can put to work for you if desired, collectively or individually. <p>Send Resume To P.O. Box 35925C3 Fayetteville, N.C. 28303 or Phone</p> <p>TOLL FREE FOR INFORMATION 1-800-334-4220 NC Collect to Pat Boss (919) 484-4101</p> <p>PROGRAMMER/ANALYST</p> <p>The Michigan Employment Security Commission has an immediate opening for a full time programmer to work on the implementation and maintenance of a statewide data retrieval system. Responsibilities will include designing, developing and documenting systems and application level programs; working with others to analyze problems, find solutions, maintain and update software. One year experience in programming for social science research applications and FORTRAN or PL-1. Qualified applicants should also have skill in writing technical documentation as well as have rudimentary knowledge of economic and statistical techniques. Salary range \$20,000-28,000 depending upon experience. Excellent benefits. Inquire Michigan Employment Security Commission, Research & Statistics Division, 7316 Woodward Ave., Detroit, MI 48202, (313) 876-5439. Equal Opportunity Employer.</p> <p>ASSISTANT DIRECTOR ACADEMIC COMPUTING</p> <p>Oregon State University invites applications for the above position, carrying rank of Research Associate or Research Assistant (unclassified). Duties include management of a staff of consultants, specialized programmers, as well as development of plans for academic computing services. Minimum requirements are an Advanced Degree in Computer Science or a related field (PhD preferred) and at least 5 years experience in a research or academic environment. Significant management or supervisory experience required and applications software development experience preferred. Salary range is \$30,000-34,000. Applicants should send a complete resume and 3 letters of reference by Sept. 25, 1980 to Mr. Thomas L. Yates, Director, Computer Center, Oregon State University, Corvallis, OR 97331. Oregon State University is an equal opportunity, affirmative action employer and complies with section 504 of the Rehabilitation Act of 1973.</p> <p>Look South</p> <p>We represent hundreds of exciting opportunities throughout the south... all fees paid!</p> <ul style="list-style-type: none"> • COBOL, Fortran P/V1 Programmers • IMS, DB/DC/VIS, MVS, Systems Programmers • IMS, IDMS, & other DB/DC exp.; Burroughs, Honeywell, minicomputers <p>Let us help you find the RIGHT position. Send your resume to:</p> <p>SEARCH E.D.P. INC.</p> <p>13772 N. Central Expressway Suite 1305 Dallas, Texas 75243 (214) 783-1018</p> <p>SCIENTIFIC PROGRAMMER</p> <p>Push the state-of-the-art in spacecraft technology and advance your technical skills. 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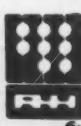
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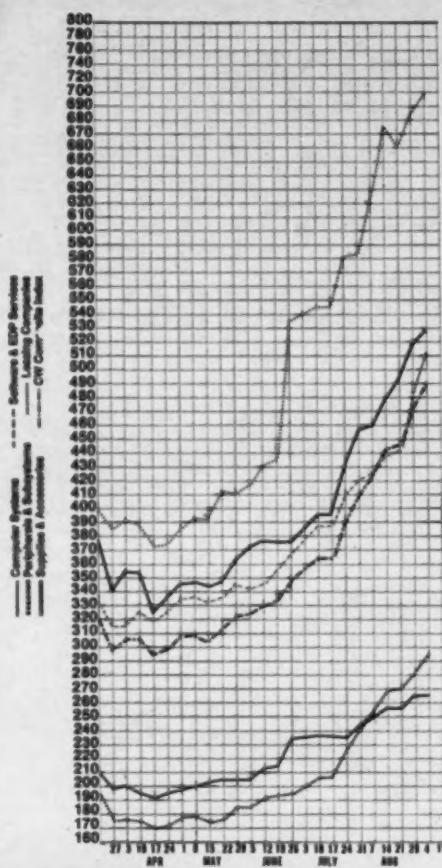
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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 3, 1980

		PRICE				PRICE				PRICE													
		1979-80		CLOSE		WEEK		1979-80		CLOSE		WEEK		1979-80									
		RANGE		SEP 3		NET		RANGE		SEP 3		NET		RANGE									
F	C	1979-80	1980	1980	CHG	1979-80	1980	1979-80	1980	1980	CHG	1979-80	1980	1979-80	1980								
H	N	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)								
COMPUTER SYSTEMS																							
A	ANDALI CORP	15	42	28	3/8	+1	7/8	+7.0	1	4	1/16	+1	1/8	+36.0	A	DATA ACCESS SYSTEMS	6	17	15	3/8	0	0.0	
N	BURROUGHS CORP	60	88	69	7/8	+2	3/8	+3.9	0	7	17	1/8	+1	1/8	+7.0	A	DATA PRODUCTS CORP	11	31	20	3/8	+1	+3.4
N	COMPUTER AUTOMATION	9	27	27	1/4	+1	1/4	+4.8	0	8	6	3/4	+1	+3.8	+3.8	A	DATUM INC	2	4	3	3/8	+1/8	+3.8
N	CONTROL DATA CORP	35	75	75	5/8	+5/8	+0.8	+0.8	0	21	19	5/8	+1	+5.3	+5.3	A	DECISION DATA COMPUT	2	9	4	1/4	+3/8	+5.3
N	CRAY RESEARCH INC	30	70	70	1/2	+2	1/2	+12.1	0	31	50	49	1/2	+3/4	+15.5	A	DELTA DATA SYSTEMS	1	3	2	7/8	+1/4	+70.9
N	DATA GENERAL CORP	60	87	85	7/8	+2	1/4	+1.4	0	3	9	3	1/2	+1/4	+6.6	A	DOCUMENTATION INC	7	27	16	3/8	+1/8	+0.7
N	DATAINTER CORP	40	80	80	1/2	+2	1/2	+4.2	0	10	20	17	1/2	+1/2	+10.0	A	DYNAMIC CORP	6	37	12	1/2	+1/4	+4.0
N	DIGITAL EQUIPMENT	53	90	89	2/4	+2	1/2	+4.2	0	11	20	17	1/2	+1/2	+12.1	A	ELECTRONIC R & E	3	8	4	1/4	+1/2	+4.0
N	FEED INC	9	19	17	1/8	+1/4	+1.6	+1.6	0	13	0	0.0	0	0.0	0	A	EVANS & SUTHERLAND	21	90	56	1/2	+1/2	+0.8
N	ELECTRONIC ASSOC.	0	12	12	0	0	0.0	0.0	0	2	7	6	7/8	+2	+4.7	A	FAMBI-TEK	1	4	3	5/8	+5/8	+20.8
N	FOUR-PHASE SYSTEMS	20	40	27	1/4	+2	1/2	+1.8	0	10	30	27	1/2	+1/2	+1.8	A	GENERAL COMPUTER SYSTEMS	1	9	4	3/8	0	0.0
N	FORWARD	31	94	49	7/8	+1	7/8	+3.9	0	21	21	19	3/4	+2	+11.2	A	GENERAL DATACOM INC	12	22	20	1/4	0.0	0.0
N	GENERAL AUTOMATION	11	30	9	7/8	+1	1/4	+2.0	0	25	32	31	1/2	+1/2	+1.0	A	GENERAL TERMINAL CP	1	4	2	1/8	0.0	0.0
N	GENERAL COMPUTER CORP	11	33	32	1/2	+1/2	+1/2	+0.3	0	26	34	31	1/2	+1/2	+1.0	A	GENEX CORP	2	10	8	1/2	+1/2	+0.7
N	HEWLETT-PACKARD CO	40	78	72	1/4	+2	1/4	+0.1	0	4	9	8	7/8	+1/4	+3.7	A	INFORIX INC	1	8	1	1/8	0.0	-0.9
N	HONEYWELL INC	60	101	62	1/2	+3/4	+0.8	+0.8	0	10	40	38	1/2	+1/2	+8.0	A	INFORMATION INTL INC	8	15	14	1/4	+0.8	0.0
N	IBM	50	79	67	1/2	+1/2	+3/8	+2.4	0	11	45	42	1/2	+1/2	+1.0	A	INTEL CORP	45	93	91	1/2	+2/3	+3.0
N	MAGNISON COMPUTER SYSTEMS	20	35	35	2/4	+3	3/4	+12.0	0	12	45	40	1/2	+1/2	+12.0	A	INTERSIL	13	33	26	3/8	+1/4	+4.9
N	MANAGERIAL ASSISTANT	9	24	24	1/2	+2	1/2	+2.2	0	13	4	3	0	0.0	0	A	LUNDY ELECTRONICS	4	12	10	0	0.0	-0.7
N	MANUFACTURING DATA SYSTEMS	27	40	46	1/2	+2	3/4	+6.2	0	14	24	23	1/2	+1/2	+9.3	A	MSI DATA CORP	5	11	10	1/8	+1/4	+4.4
N	MINI-COMPUTER SYSTEMS	2	6	4	3/8	0	0.0	0.0	0	15	26	24	1/2	+1/2	+2.0	A	MONHARD DATA SCI	10	27	21	1/2	+3/4	+11.2
N	MODULAR COMPUTER SYSTEMS	19	25	24	1/2	+2	1/2	+13.3	0	16	34	32	1/2	+1/2	+14.4	A	ONEX	2	10	8	1/2	0.0	0.0
N	NCR	92	62	72	1/2	+1	1/2	+2.1	0	17	40	38	1/2	+1/2	+2.1	A	PARADYNE CORP	18	43	41	1/4	+7/8	+2.1
N	PRIME COMPUTER INC	15	99	39	1/2	+4	1/2	+4.0	0	18	50	49	1/2	+1/2	+1.0	A	PARTRIDGE CORP	9	15	12	1/2	+1/2	+1.0
N	PRIMACON-ELMELP	28	60	59	1/2	+3	1/2	+0.6	0	19	58	57	1/2	+1/2	+0.6	A	PARTRIDGE CORP	10	27	21	1/2	+3/4	+1.0
N	SPRINT	40	58	58	1/2	+3	1/2	+0.6	0	20	60	59	1/2	+1/2	+0.6	A	RECOGNITION EQUIP	5	18	15	3/8	0	0.0
N	SYSTEMS ENG. LABS	11	33	32	1/2	+3/8	+0.3	+0.3	0	21	34	33	1/2	+1/2	+1.2	A	SCAN DATA	1	5	3	1/8	+3/8	+12.7
N	TAHOE COMPUTERS INC	13	48	46	1/4	+2	1/2	+1.0	0	22	66	64	1/2	+1/2	+1.2	A	STORAGE TECHNOLOGY	12	22	19	7/8	+1/2	+2.4
N	TEXAS INSTRUMENTS	70	127	125	1/4	+1/4	+0.1	+0.1	0	23	140	137	1/2	+1/2	+1.0	A	T-BEC INC	3	9	5	3/8	+1/8	+2.2
N	WANG LABS.	17	52	51	5/8	+3	5/8	+7.5	0	24	18	17	3/4	+2	+4.7	A	TECH INC	4	10	6	1/2	+1/2	+1.0
LEASING COMPANIES																							
D	ROTHMUELLER FINANCIAL CORP	13	20	18	1/4	0	0.0	0.0	0	15	22	21	9/8	+3/4	+3.5	A	TELEFONICA	3	6	5	3/8	+1/8	+1.0
N	COMDISCO INC	6	17	18	1/4	+1	1/4	+6.8	0	16	29	26	1/2	+1/2	+2.2	A	TELEFONICA INC	3	6	5	3/8	+1/8	+1.0
N	COMPUTER GROUP CORP	1	2	2	1/2	0	0.0	0.0	0	17	34	34	0	0.0	0.0	A	TELEFONICA INC	1	2	2	3/4	0.0	0.0
N	COMPUTER SYSTEMS GRP	2	15	15	1/2	0	0.0	0.0	0	18	34	34	1/2	+1/2	+1.0	A	TELEFONICA INC	15	30	30	1/2	+5/8	+1.0
N	CONTINENTAL INFO SYST	2	15	14	1/2	+3/4	+0.2	+0.2	0	19	34	34	1/2	+1/2	+1.0	A	TELEFONICA INC	15	30	30	1/2	+5/8	+1.0
N	DATRONIC RENTAL	2	3	3	1/4	+1/4	+0.3	+0.3	0	20	34	34	1/2	+1/2	+1.0	A	TELEFONICA INC	15	30	30	1/2	+5/8	+1.0
N	DCL INC	3	8	8	1/2	0	0.0	0.0	0	21	34	34	1/2	+1/2	+1.0	A	TELEFONICA INC	15	30	30	1/2	+5/8	+1.0
N	DPF INC	9	12	8	1/2	+3/8	+6.4	+6.4	0	22	37	37	1/2	+1/2	+2.2	A	TELEFONICA INC	15	30	30	1/2	+5/8	+1.0
N	ITEL	1	15	2	1/2	+1/4	+11.1	+11.1	0	23	40	40											

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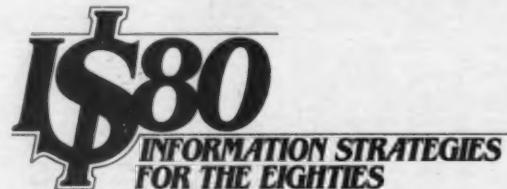
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